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In a recent talk before the City Club of Chicago F. A. Delano mentioned one phase of the subject of the development of waterways at government expense that has seldom been alluded to. This is, that it will tend to make railway rates to points where there is water transportation *below* the average, and to make railway rates to points where there is no water transportation *above* the average. "In other words, the inland point, far away from water and not having the advantage of water transportation, will have to pay a little more than its share because the railway has to compete with the water at the point where there is water transportation." Those who live and do business at inland points will be taxed as much to pay, for example, for the digging of a deep waterway from Chicago to the Gulf as those who live and do business on the waterways. While the railway rates of those at inland points may not be made *absolutely* higher by waterway development they are pretty sure to be made *relatively* higher as compared with those of their competitors on the waterway, and of course it is not the absolute rates to any point

but the relation of its rates to the rates of the commercial centers with which it competes that determine whether it shall grow and prosper. The number of large commercial centers on waterways is much greater than the number of large centers inland; but the number of small manufacturing and jobbing centers inland is far greater than the total number of large manufacturing and jobbing centers. Inland places have always been, and always will be, chiefly dependent for their prosperity upon good means of transportation by rail; and it would seem that they have a right to demand that, if the government shall tax the entire country for the development of waterways, it shall at least do nothing to discourage the development of railways. In his recent speech before the Traffic Club of Chicago, Congressman Ransdell, of Louisiana, warned the railways that if deep waterways were built the roads would arouse more hostile public sentiment against themselves if, in meeting the competition of the boats, they discriminated against points not having water transportation. But if the roads did not meet the water rates the waterways would not have the effect, for which their construction is advocated, of reducing railway freight rates; if the railways did meet the water rates without reducing rates proportionately to inland points the result would be a discrimination against inland points; and if they met water competition, and also reduced their rates proportionately to inland points the roads probably would be bankrupted, and the inland points, depending solely on the railways for transportation, would be crippled by lack of transportation facilities.

IMPROVED SHOP ORGANIZATION.

Railway shop organization of the present day shows a tendency toward giving the tool room foreman more prominence. The general conception has always been that the foreman of machines should have jurisdiction over all the machine tools, at least those within the machine shop. This jurisdiction may even extend over all the tools in the various shop buildings, but it has always included those used in tool making. The tendency now seems to be toward requiring the tool room foreman to report, not to the foreman of machines, but directly to the general foreman. This has undoubtedly come about, as does most improvement in any organization, as a remedy for a recognized weakness. When the tool room is considered as a part of the machine shop, as is generally the case, it comes to be considered the same as any other group in the main shop and gets no more attention from the foreman of machines than does any other. In fact, it even receives less attention, since it has its own foreman, and an organization weakness becomes marked in times of general crowding of all the machines. The machine foreman may have some lathe work which he sends to the tool room because his machines out in the shop are crowded and the result is that the work under way in the tool room must wait. The same movement seldom operates the other way when the tool room is over busy; consequently tool room work gets behind and its foreman is not able to plan and carry out his work, due to interruptions. If he be independent of the foreman of machines and required to report only to the general foreman, work which is sent to him from the outside shop will not be allowed to interrupt the regular tool room schedule. We understand that this plan is now in operation in all the shops of the Erie, and that it is being considered by other roads.

An instance of increased consideration being given the subject of tools is evidenced by the system now in use in one of the shops on the Erie, described in our issue of March 26, in an article by W. J. Eddy, general tool inspector. His jurisdiction extends over the entire system and his recommendations reach the different shops through their master mechanics, who are responsible, not to the tool inspector, but to the general mechanical superintendent. This machine tool system

is undoubtedly elaborate, and some may say too much so, but we believe that it is thoroughly practical for large shops. It may be argued that considerable time is lost in making trips to and from the tool room and in waiting at the window for tools, and anyone who is familiar with the shop knows this to be the case, but with the proper machine tools ground to correct cutting edges, clearance, etc., this loss should be more than made up in the increased efficiency of the machines. If, as is claimed for this system now in use on the Erie, a direct saving of 45 per cent can be effected in a year, an argument against such a system will necessarily have to be a substantial one.

THE NEW ENGLAND RATE DISPUTE.

The dispute over the New England freight rates westward has been slowly but with steady upward movement reaching an acute stage. Beginning several weeks ago with meetings of the executive committee of the trunk line association the general subject was gone over but no agreement reached. Next came the appeal of the committee to the trunk line presidents. These have held a number of meetings and there has been a new series of special "committee" deliberations. At one time there seemed a likelihood of agreement based on the equation of all the New England rail rates westward and of the New England westward rail and water rates also. But this has involved higher rates westward from Boston and northern New England; has met the veto of the Grand Trunk; has provoked a storm of protest from shippers of Boston, of Providence and of central and northern New England points; and finally has encountered the opposition of the Boston & Maine, which holds that by the proposed readjustment it would suffer pains and penalties under the Sherman act. A situation already complex thus falls into new confusion.

The record of the case may be briefly made up to date. Several months ago the New York, New Haven & Hartford Company arranged with the Canadian Pacific for an all-rail rate to the West with a rate equal to the preferential given to the Grand Trunk by water and rail *via* New London. There was thus opened to the New Haven an all-rail preferential route not only to Canadian points but directly or indirectly to Detroit, Chicago, St. Paul and St. Louis. It was met by a request of the Grand Trunk for a similar all-rail arrangement with the New Haven. This was refused unless the Grand Trunk would accede to what was tantamount to a surrender to the New Haven of the Grand Trunk's southern outlet at New London *via* the New London Northern. The two companies disagreeing the Grand Trunk refused to renew its contract for use of the New Haven's boats between New York and New London and proposed to put on boats of its own. This was the starting point of the controversy which, at first, seemed of a localized character affecting only two New England lines and a not very large volume of business—perhaps also overlooked at a time when economy of operation to meet reduced earnings was the overshadowing problem of the trunk lines.

But the situation deepened and broadened. The New Haven-Canadian Pacific combination began to increase its business. It began to take westward traffic from New York over the Canadian Pacific to a considerable amount. The steamship lines connecting with the Southern Central rail systems and enjoying preferential rates began to complain and threaten. Incidentally came the Boston & Maine's import rate reductions. Thus the controversy has spread and thickened until the whole trunk line question of rates is, contingently at least, involved. The New Haven has apparently used successfully its new all-rail preferential as a "club" to force trunk line consideration of readjustment of rates and of redress for what it claims are grievances based on non-preferential rates for its own remoter territory, which, nevertheless, the

Grand Trunk is allowed to bisect while at the same time it—the New Haven—suffers from the preferential given its northern points such as Springfield, Worcester, Boston and other Massachusetts cities.

We have stated the situation in some of its bolder outlines and without giving rate figures—it is complicated enough in its mere description. It involves the most varied interests and considerable variations of schedules as well as territorial considerations of diversity and magnitude affecting both the shippers and the transportation companies. There are "in the ring," so to speak, some 15 such companies and the rate complexities are many and profound. There are all-rail rates, lake and rail rates, coastwise and rail rates, river and rail and lake rates, rates based on relative distance and on transshipment. Public sentiment, as moulded by shippers opposed to *any* increase of rates, is another and powerful influence in the controversy. It has been thought that the opening of the lake and rail routes as diminishing the New Haven-Canadian Pacific business will make the question less acute, and this is, no doubt, measurably true. But it means, at most, but a truce for a few months lasting until interior water navigation closes. That there will be a final readjustment and harmony of interests no one can doubt. The interests at stake are too vast, just as business is beginning to recover, to risk a serious war of rates growing out of a few cents a hundred in the schedules. Meanwhile the interesting factor in the situation to watch is the New Haven. We have heretofore pointed out how its control of the Boston & Maine and domination of New England meant problems ahead for the trunk lines. The Canadian Pacific alliance and its results on the trunk lines situation is at once a fact and an omen.

GETTING DOWN TO FUNDAMENTALS.

It is a good thing to get down occasionally to fundamentals. F. A. Delano, in his recent admirable address at Hannibal, Mo., sank a shaft to some of the fundamentals of political economy and of human nature which have a direct and important relation to the policy of government regulation of railways, but which have been pretty generally ignored recently by those who have been working out and applying the details of this policy. He recalled that it has not been many years since the fundamental principle of political economy was *laissez faire*, "let things alone," the theory being that the less the government interfered with business the better it would be for both business and government. As Mr. Delano said, we do not hear much of this theory now. It has been supplanted by the theory that the free operation of commercial and industrial forces gives rise to evils that must be suppressed, or fails to confer benefits that can only be obtained, by constant watchfulness and supervision by government over industry and commerce. It is assumed that men will not or cannot grow the right kind of crops, or make the right goods, unless aided and stimulated by a protective tariff; that railways will not or cannot furnish adequate service at reasonable rates, or treat their patrons fairly, unless some public body shall tell them what they ought to do and warn them against what they ought not to do.

Perhaps there are some people who think that this theory of the need for constant governmental supervision and control of business is new, but, as Mr. Delano recalls, it is a very old theory. It was tried thoroughly by every nation of Europe until early in the Nineteenth century. There then set in a powerful reaction against it. Statesmen, following in the footsteps of students of the sciences of politics and economics, decided that when government tried to tell business what it ought to do and what it ought not to do, it always accomplished very little good and very much harm. There was a wave of legislation that wiped from the statute books, especially in England, many of the laws that restricted the freedom of commerce. The way that the leading statesmen and think-

ers at that time regarded previous attempts of government to direct and control business is illustrated by the following striking remarks of Henry Thomas Buckle in the first volume of his "History of Civilization in England," which was published in 1857 when the reformatory movement was at its height:

"Every great reform which has been effected has consisted, not in doing something new, but in undoing something old. The most valuable additions made to legislation have been enactments destructive of previous legislation; and the best laws which have been passed have been those by which former laws were repealed. . . . The whole scope and tendency of modern legislation is to restore things to that natural channel from which the ignorance of preceding legislators have driven them. . . . But though we may thus be grateful to individual lawgivers we owe no thanks to lawgivers as a class. . . . It is clear that the progress of civilization cannot be due to those who on the most important subjects have done so much harm that their successors are considered benefactors simply because they reverse their policy and thus restore affairs to the state in which they would have remained if politicians had allowed them to run on in the course which the wants of society required."

The time may never come again when the "let things alone" theory will be so generally accepted by all thinkers and statesmen as obviously correct as it was about 60 years ago; but that the time will come when some future writer of authority will say of present legislation for the regulation of business, as Buckle said of such legislation in his day, that the greatest reform that could be effected would be the repeal of most of it, we have no doubt. It is but a matter of years and experience until the public will make the discovery once more that, however much evil may result from the free management of industries by those who understand them, much more evil results from constant interference with those industries by public officers who have no expert knowledge of them. The sound common sense of the American people will sooner or later awaken to the fact that there are natural laws of economics as well as of physiology and pathology; that it is as dangerous to let quacks tinker with ailing business and industry, in defiance of the natural laws, as it is to let them tinker with ailing human bodies, and that while business may sometimes need a physician, it is safer, if a physician of experience and recognized ability cannot be had, to let disease run its course, than to let every political and economic empiric who comes along try some new nostrum on the patient. Sooner or later the people will learn that in about 90 per cent. of the cases of business ailments nature, if given a fair chance, will prove a better healer than even the best of physicians.

The contemporary theory of regulation of railways assumes that the public and public authorities are the right persons to decide how a railway shall be run and how much money it shall make. As Mr. Delano intimated, this runs counter to human nature; and human nature must receive more consideration in the regulation of railways if regulation is not to continue to do more harm than good. Men invest their capital in railways to make money. The legislatures and commissions may legally reduce their rates to any point above confiscation, and courts may perhaps constitutionally hold that rates that yield a return of 6 per cent. or more are not confiscatory. But the owners of railways are apt to disagree with the legislatures, commissions and courts. They are apt to insist that they shall be allowed more than 6 per cent. If they do not get more they are apt to refuse to invest much more money in railways, and while the regulating authorities and the courts can restrict the return from existing investments to a fixed percentage, they cannot compel anybody to invest any more money. They may wax indignant against capitalists for not bowing before the superior wisdom of public authorities. They may denounce them for being so selfish as to want larger profits than public authority may think they ought to have. But such indignation and such denunciations will be wasted. Those who invest money in railways are simply selfish human beings like those who invest money in farms and stores and factories; and if the government, by a

protective tariff, for example, makes investments in manufacturing unusually attractive, and by government regulation makes investments in railways unusually unattractive, capitalists, regardless of what legislatures, or commissions, or courts may think, will withhold their money from railways and put it into manufactories.

They are withholding it from investments in railways now. We hear a great deal of talk about the return of prosperity being delayed by the tariff agitation. It is notable, however, that the largest industry in the country that is still closely restricting the number of men it employs and the amount of materials it buys is the railway industry. This is due both to the fact that a relatively small amount of traffic as compared with the traffic of recent years is moving, and that the roads and those who might, under different conditions, be disposed to invest in them are constantly harassed by doubts as to what the legislatures, state commissions, congress and the Interstate Commerce Commission are going to do that will further increase their costs of operation and further reduce their earnings. A continuation of this state of affairs will make the railways unable to handle the largely increased traffic that will come to them when good times return. No doubt they will be denounced as they were two years ago for not having sufficiently increased their facilities; but as long as human nature is human nature men will continue to refrain from pouring into any business millions of capital on which they have been warned by the government that they will not be allowed to earn a large return no matter how well managed the properties in which it is invested may be, and on which they are certain to earn no return at all if, owing to conditions that they cannot foresee, the investment shall prove to have been unwise.

THE STRENGTH OF BRICK AND TERRA-COTTA BLOCK COLUMNS.

Compared to our knowledge of structures built of wood, steel or concrete, our knowledge of the properties of structures built of brick, stone and terra-cotta is small. This is true especially of the last, for while a number of tests on brick columns are on record, the use of terra-cotta blocks in compression members is comparatively recent, and therefore there is little on record concerning their properties in such applications. It is well known, of course, that terra-cotta can be made of tremendous strength, being a matter of burning. But it is not necessary that it be burned to withstand stresses higher than 8,000 lbs. per square inch, since its value as a building material is limited by the strength of the Portland cement mortar joint which it is necessary to use with it. A carefully made 1:3 mortar may withstand compressive stresses up to 6,000 lbs. per square inch, and the addition of metal fabric to the joints will give another 2,000 lbs., or 8,000 lbs. total, so there is no advantage in burning the tile harder than this. Makers of this tile with systems for its use in building construction have a good many unpublished tests of column, wall and floor designs which afford valuable experimental data. For example, in some tests of hollow tile wall construction made by R. W. Hunt & Co. a 4-in. wall 12 ft. high sustained a load of about 61 tons per lineal foot without injurious deflection. This represents the average of six different tests, the maximum allowable deflection in each case being 1 in.

A bulletin just issued by the University of Illinois* describes tests of 16 columns built of terra-cotta blocks and an equal number of short columns or tiers of brick. The length of the columns varied from 10 to 12½ ft. The lateral dimensions were 12½ in. x 12½ in. for the brick, and ranged from 8½ in. x 8½ in. to 17½ in. x 17½ in. for the terra-cotta. Different qualities of mortar and grades of workmanship in laying were used. The terra-cotta columns were built and tested in two

*Bulletin No. 27 of the Engineering Experiment Station, University of Illinois: Tests of Brick Columns and Terra-Cotta Block Columns.

lots, about a year intervening between the tests. The two lots were alike as to quality, but there was a difference in the ends—the bearing faces—the second lot being approximately plane, while the first were appreciably concave, as much in some cases as 3/16 in. Thirteen of the columns were laid with the care usually given to such work, and the remaining three were put up hurriedly to get the effect of poor laying.

The results of these and the brick column tests can be indicated here only in a brief, general way. Portland cement mortar was used in all of the terra-cotta columns and 13 of the brick columns. Lime mortar was used in two brick columns, and natural cement in one. The brick used was of two kinds, 14 columns being of shale building brick, and two of underburned clay brick. Both poor and good laying were represented in the brick columns, as in the terra-cotta. Loads were applied both centrally and eccentrically; also continuously to failure or to the capacity of the machine in some instances, and with full release between increases in others. Regarding the results, the Bulletin says:

"Both brick columns and terra-cotta columns gave high strengths in all cases where strong mortar and care in building were used. For central loading, the strength of the brick columns ranged from 3,220 to 4,110 lbs. per sq. in., and the strength of the terra-cotta block columns from 2,700 to 3,790 lbs. per sq. in., the columns having the highest resistance not falling at the full capacity of the machine. The effect of the strength of the mortar is apparent in the carrying capacity developed in the columns; lower loads were found in columns built with 1:5 Portland cement mortar than in those with 1:3 Portland cement mortar, still lower loads in those with 1:3 natural cement mortar, and still lower in those having 1:2 lime mortar. The effect of the quality of the brick is shown in the columns made with inferior brick, which carried only 31 per cent. as much as columns built with the better grade of brick. In the case of the terra-cotta columns, blocks which were culled out as somewhat inferior gave a column strength perhaps 30 per cent. less than the columns built with superior blocks. The effect of the attempt to represent hurried or careless workmanship in two brick columns and in three terra-cotta block columns was a loss in strength of about 15 per cent. and 25 per cent., respectively.

"The ratio of the strength of the columns to the compressive strength of the individual brick and block is of interest. In the well-built brick columns loaded centrally, the ratio of strength of column to compressive strength of individual brick ranged from 0.31 to 0.37, and in the underburned clay brick column the ratio was 0.27. In the terra-cotta block columns with central loading the ratio of strength of column to that of individual block was 0.74 for the incomplete test, and 0.83, 0.85, and 0.89 for the others. If, as seems to be the case, the strength of the brick or block to resist cross-breaking is an element in determining the strength of the built-up column, a deeper or thicker brick would give higher column strength. It is possible that this partially accounts for the fact that the ratio is found to be higher for terra-cotta block columns than for brick columns. The tests suggest that the ability of individual pieces to resist transverse stress is an important element in the strength of the completed column. This suggestion may have an important bearing on the advantageous size of the component blocks which may be used in compression piece where high strength is desired."

Some of the terra-cotta columns by R. W. Hunt & Co. show even higher results than those given above, the difference being attributed to the advantage due to more permanent, and therefore somewhat more efficient, facilities for making special tests of this sort. An interesting test of a cylindrical hard-burned terra-cotta tile column was made by this concern last fall. This column was 21 3/4 in. in diameter and 21 ft. 9 1/2 in. high. It had seven tiles in the outside course, three in the inside course and was reinforced with six 3/8-in. twisted steel rods. The thickness of the tiles was 2 1/4 in., there being 106 courses in the column. It was laid with 1/4-in. Portland cement mortar joints. The outer courses of tile each had a 1-in. groove 1/4 in. deep in which was laid a round ring of 3/16-in. wire 16 in. in diameter. The column, which weighed complete 7,816 lbs., was shipped on a flat car 900 miles to Phoenixville, Pa., for test in the large machine of the Phoenix Iron Works. It withstood a load of 1,500,000 lbs. without reaching the elastic limit, and was then reshipped to the place where it was built.

A practical difficulty, as yet unsolved by terra-cotta con-

struction engineers, occurs in buildings which are tall enough to require wind-bracing. The wind-bracing being steel, all of the outside columns have to be of steel also, as no satisfactory way has been found for connecting the steel bracing to terra-cotta columns. This does not occur in buildings up to five stories, say, where the exterior brick walls aid the columns in carrying the load and lateral bracing is not required. On the higher buildings referred to all interior columns may be terra-cotta, of course. Some difficulty is also encountered when reinforced concrete and terra-cotta are used in the same structure, at points where members of these respective materials must be joined, higher maximum stresses being allowed by most city building departments for the tile construction than for the reinforced concrete. The method followed in this instance is to corbel out from the tile column to support the concrete member.

DELAWARE & HUDSON.

A decision by the Supreme court of the United States holding the commodity clause of the act to regulate commerce constitutional would in all probability necessitate some transfer of the ownership of coal lands from the Delaware & Hudson Company to its stockholders or others. The showing made last year by the company might well be used as an illustration of the evil that may result if the ownership of the coal lands is divorced from the ownership of the railway.

The total railway operating revenue amounted to \$18,500,000, and of this revenue, \$9,100,000 was derived from coal freight, and, moreover, besides forming nearly half of the total railway revenue, the revenue from coal freight is by far the most dependable source of income. Total railway operating revenue decreased by \$1,700,000 from the high figures of 1907, but the revenue from coal freight was about \$100,000 greater in the 1908 year than in the generally far more prosperous 1907 year. The coal department, which includes the mining and selling of coal and for which figures are given separately, had gross receipts of \$23,800,000 in 1908 and \$23,600,000 in 1907, with gross expenses, excluding taxes, of \$22,700,000 and \$22,400,000 in the two years respectively. This leaves net earnings from the coal department of but \$1,100,000 and \$1,200,000 in the two years, while the railway net earnings were \$7,700,000 in 1908 and \$8,500,000 in 1907; in other words, net earnings of the coal department are but 5 per cent. of gross receipts, while net earnings from railway operation are 41 per cent. of gross receipts.

It would appear then that the great value of the coal lands to the Delaware & Hudson Company comes from the freight which these coal lands furnish the railway and not from the net earnings of the coal department itself. Anything, therefore, that might give the control of the routing of coal shipments to others than the management of the railway would expose the D. & H. to very serious loss; to loss which, if this line of argument is correct, would amount to actual confiscation of property, since there is a real value which is not represented either by the coal properties or the railway properties, but is of the nature of good-will, arising from the working of the two in harmonious conjunction.

It has been the policy of the company in the past to acquire coal lands whenever they could be obtained at an attractive price. As has already been pointed out, this policy was justified by the company's earnings from coal freight in the year of business depression.

After paying fixed charges and rentals, the company carried to profit and loss \$5,300,000 last year as against \$6,500,000 in 1907. This is 12.39 per cent. on the \$42,400,000 capital stock in 1908 and 15.25 per cent. in 1907.

With a decrease in earnings due to a loss in merchandise freight traffic and passenger traffic amounting to \$1,700,000, the company was able to reduce operating expenses by \$900,000, the total railway operating expenses being \$10,800,000 last year.

The expenses for conducting transportation were reduced about \$400,000, and the remainder of the reduction in total expenses is accounted for by reductions in both maintenance of way and maintenance of equipment. The cost of maintenance of way per mile of first, second, third, etc., track (switch tracks and sidings being counted as half) is shown in the following table. The table also shows the unit cost of maintenance of equipment:

	1908.	1907.
Maintenance of way, per mile.....	\$940	\$1,269
Repairs per locomotive	1,909	2,081
" passenger car	249	344
" freight car	46	44

Freight statistics show that the number of tons carried one mile totaled 2,135,000,000, a decrease of about 376,000,000. The

ticularly hard for the Delaware & Hudson to prevent the increased empty car mileage because so large a proportion of its freight hauled north is coal, while it depends on general merchandise to furnish tonnage for the southbound haul. In 1907 the loaded mileage of home and foreign freight cars northbound was 67,450,000 and the empty mileage, 4,160,000, the southbound mileage was 30,800,000 and the empty, 39,500,000. In 1908 the loaded mileage northbound was reduced to 62,000,000 miles and the empty mileage increased to 6,000,000 miles. At the same time, the loaded mileage southbound was 24,950,000 miles and the empty mileage, 43,100,000 miles. The reason for this is shown by larger proportionate decreases in products of agriculture, products of forests and manufactures, than in the tonnage of anthracite coal.

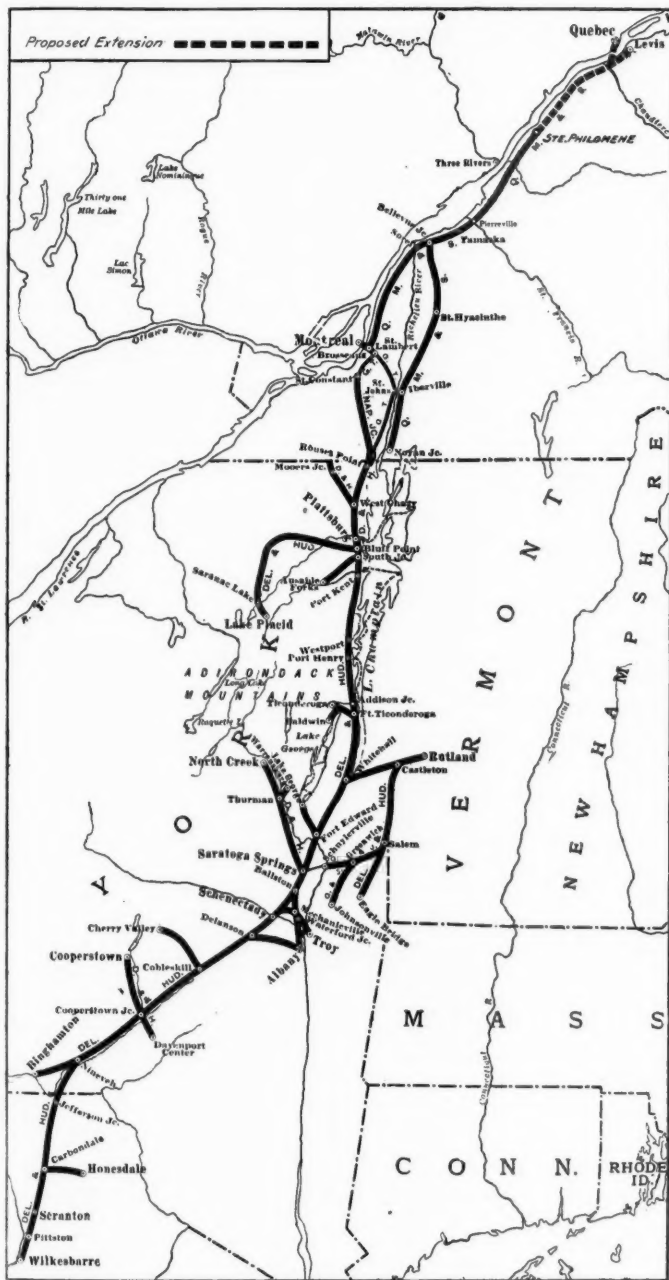
In the review of the Delaware & Hudson Company's report for 1907 the value of the street railway properties owned by the company was gone into somewhat fully, and it is unnecessary to repeat the descriptions of these properties here. The unprosperous condition of the country made the operation of the electric railways considerably less profitable than should be the case in a normal year. No dividends were declared last year by any of the subsidiary electric street railway properties with the exception of the United Traction Company, which paid 4 per cent. in 1908. The Delaware & Hudson Company owns approximately \$12,500,000 of the United Traction Company stock, so that the income from this source was about \$500,000, and apparently this is the only income derived from the electric properties during the year.

Closely connected with this question of ownership of the controlling interest in street railway properties is the question of expansion through the acquisition of other steam railway properties. During 1908 the New York & Canada and the Cherry Valley, Sharon & Albany Railways were merged with the Delaware & Hudson Company, and 171 miles of road were thus added to the steam railway property and \$9,600,000 transferred from investment assets to cost of road and property.

The balance sheet shows current liabilities of \$14,755,925 in 1908 and current assets of \$18,834,858, but included in these current assets is \$8,039,450 advances for construction and acquisition of new lines, which although generally given under current assets, is in reality more nearly a capital asset. Cash on hand amounted to \$830,919 in 1908 and \$2,387,851 in 1907. This rather small working capital may be in part due to the trouble the company had in getting permission from the Public Service Commission to issue its bonds.

Application was made to the Public Service Commission to issue \$20,000,000 bonds, part of the proceeds of which was to be used to reimburse the railway company for advances for construction and acquisition of new lines. The Commission authorized the issue of \$13,539,000 bonds but reserved decision on the question of issuing the remaining \$6,461,000. The company applied for the issue of these remaining bonds to discharge its obligations incurred to pay the cost of outstanding securities of the Hudson Valley Railway and of additional coal lands in the state of Pennsylvania. All of these obligations were incurred before the passage of the Public Service Commission law. After reconsideration permission to issue the additional bonds was refused. The decision of the Commission apparently sets up the rule that if the company had incurred liabilities which were perfectly legal at the time, that is, before the passage of the Public Service Commission law, and that now if the Commission does not approve of the purposes for which these liabilities were incurred it can refuse permission to the company to fund the liabilities. This decision of a majority of the commissioners (one commissioner dissenting wholly from the decision and another in part) is a form of retroactive legislation that has been tried before, but by no means always upheld when brought to a test before the higher courts. The Delaware & Hudson Company is now testing the decision before the Supreme Court of the United States.

The following tables show the results of operation for the



Delaware & Hudson.

average miles each ton was carried also decreased, being 121 last year, about half a mile less than in the previous year. The average number of loaded cars in a train was 16.24, or 1.46 less than in 1907, and the average number of empty cars in a train was 9.16, or 1.29 more than in 1907; in other words, the percentage of freight car mileage made by loaded cars was 64 per cent. in 1908 as against 69 per cent. in 1907. This is the lowest per cent. in any year since 1899, and it was par-

last two years, not including the operation of the lines in Canada or the electric lines, and the general balance sheet.

Results of Operation

	1908.	1907.
Average mileage operated	845	845
Coal freight revenue	\$9,106,820	\$9,081,664
Merchandise freight revenue	6,162,181	7,553,810
Passenger revenue	2,693,672	2,944,743
Total operating revenue	18,500,731	20,165,440
Maint. way and structures	1,417,319	1,879,546
Maint. of equipment	2,219,543	2,356,514
Traffic	204,849	191,669
Transportation	6,528,112	6,900,431
Total operating expenses	10,811,721	11,694,429
*Net railway earnings	7,689,011	8,471,011
*Net earnings coal department	1,145,418	1,173,206
*Gross income	10,339,104	11,208,518
Taxes	705,331	568,589
Net income	5,254,458	6,466,173
Dividends	3,816,000	3,816,000
Surplus	1,438,458	2,650,173

*Before the deduction of taxes.

Consolidated Balance Sheet.*

Assets.				
	1908	1907		Increase or decrease
Coal lands	\$20,821,971.63	\$17,248,002.04		\$3,573,969.59
Real estate	4,363,603.35	4,200,299.15		163,304.20
Railway construction	27,293,160.89	16,518,429.43		10,774,731.46
Railway equipment	19,961,069.94	19,353,578.36		607,491.58
Marine equipment	9,940.00	9,940.00		
Coal department equipment, cars, motors, mules, horses, etc.	1,022,411.24	967,977.74		54,433.50
Coal handling and storage plants	273,447.27	298,265.26		24,817.99
Stocks and bonds	23,364,060.57	32,203,146.18		8,839,085.61
Supplies on hand	2,920,837.73	3,121,967.04		201,129.31
Coal on hand	1,283,206.09	836,042.81		447,163.28
Fire insurance fund	249,142.49	220,047.27		29,095.22
Cash	830,919.34	2,387,851.48		1,556,932.14
Bills and accounts receivable	4,386,130.06	4,356,471.83		29,658.23
Advances on unmined coal	501,947.87	474,167.42		27,380.45
Advances for construction and acquisition of new lines	8,039,449.86	1,675,338.43		6,364,111.43
Power plant	623,625.00	521,419.94		102,205.06
Total	\$115,944,523.33	\$104,392,944.38		\$11,551,578.95
Liabilities.				
	1908	1907		Increase or decrease
Capital stock	\$42,400,000.00	\$42,400,000.00		
Bonds	46,961,000.00	34,227,000.00		\$12,734,000.00
Loans payable	8,500,000.00	10,754,949.87		2,254,949.87
Interests, dividends, etc., accrued	613,784.67	512,058.00		101,726.67
Interest, dividends and bonds due and not yet collected	193,601.10	198,933.85		5,332.75
Accrued taxes	112,041.16	111,761.71		279.45
Sinking fund	805,454.55	400,941.96		404,512.59
Audited vouchers and pay rolls	3,611,577.61	4,116,718.03		505,140.42
Other accounts payable	919,465.92	906,020.82		13,445.10
Total Liabilities	\$104,116,925.01	\$93,628,384.24		\$10,488,540.77
General profit and loss, being excess of assets over liabilities	11,827,598.32	10,764,560.14		1,063,038.18
Total	\$115,944,523.33	\$104,392,944.38		\$11,551,578.95

*Includes Hudson Coal Co., and Northern Coal & Iron Co., all the capital stock of which is owned by The Delaware & Hudson Co.
NOTE—Decreases in *italics*.

NEW PUBLICATIONS.

The Railway Locomotive. By Vaughan Pendred, M. Inst. Mech. E. M. I. & S. Inst. Published by Archibald Constable & Co., London; D. Van Nostrand Co., New York; 1908. Cloth; 300 pages; 5½ x 8½ in. Price, \$2.

In the introduction the author offers an excuse for adding to the large number of books on the locomotive, but the fact is, there are comparatively few satisfactory books in English on this subject. The best technical books on locomotive design and construction are in German or French, and on this particular phase of the subject—design and construction—there are really none of any value in English. The present volume does not fill this need but deals with the locomotive in a general way, always intelligently and so interestingly that it may be read with profit by the engineer as well as the layman. The aim has been to make the study of the locomotive attractive, and, though little effort has been directed to mathematical treatment, the book is well adapted to the need of the student. It is not a history, though it contains much that is historical; nor is it a treatise which

seeks to establish theories, though in many cases it deals with facts that are fundamental. The volume is rather a series of logically arranged essays, each one of which reflects the personality of the author. It approaches the subject from the world's viewpoint, but English practice and English standards naturally receive chief attention, and where estimates of value are given these are usually measured by the degree to which the detail concerned has entered into English practice. The subject is treated under three grand divisions: the locomotive as a vehicle; the locomotive as a steam generator, and the locomotive as a steam engine. In the chapter on frames, the origin of the bar frame in the United States is explained in a manner which is new to us and worth repeating. In the early days the United States possessed no rolling mills which could make plates fit for side frames. The average smith had skill enough to build up bars forged under a water-driven tilt hammer, so the bar frame found favor and is still retained.

The construction of the English engine truck and its action on curves is clearly explained, and the vehicle is further considered under the chapters on wheel and rail adhesion, propulsion and counterbalancing. The section on the boiler is particularly interesting and occupies one-third of the book, covering the various features of boiler design, boiler performance, combustion and superheating. The treatment of the locomotive as a steam engine is a remarkable piece of condensation, but each detail is considered with due proportion and in a satisfactory manner. The valve and valve gear are naturally prominent, and while not treated with any completeness, the chapters dealing with them form a good introduction to the subject. The author explains why compound locomotives have not been very successful in England, and says that, while for long runs the Webb compound passenger engine was fairly successful, whether or not it was economical remains to this day a disputed question. In the portion relating to locomotive performance frequent reference is made to the experimental work of Prof. Goss at the locomotive laboratory at Purdue and his published works on this subject, and to the results of the locomotive tests at St. Louis in 1904. The illustrations are rather uneven in their selection and in the character of the drawings, and a slight mistake has been made in the section lines of the cylinder on page 207, so that the cylinder wall is keyed rigidly into the space for the packing ring on the piston head.

At the end of the volume there is a list of standard works on the locomotive with the dates of publication. If the library is to contain but one book of moderate cost on the locomotive, we should be inclined to recommend Mr. Pendred's interesting treatise as the one to be selected.

Letters to the Editor.

PROBABLE EFFECT OF "RECIPROCAL DEMURRAGE."

Scranton, Pa., March 31, 1909.

TO THE EDITOR OF THE RAILROAD AGE GAZETTE:

I have read with interest Mr. Melcher's memorandum, printed in your issue of March 26, which he submitted to the railroad committee of the Iowa Senate, opposing the adoption of a "reciprocal demurrage" bill. I have not read the bill referred to, but, as the name discloses, and as most of the arguments of the advocates of "reciprocal demurrage" reveal, it is undoubtedly of such character that we are safe in saying that, like all other such legislation, it has its origin in a spirit of revenge for demurrage penalties incurred. The law seems to be designed as a means of getting even with the railways for their enforcement of demurrage regulations. Otherwise they would not call it "reciprocal" nor "demurrage." In fact, such laws constitute a peremptory demand for a more rigid enforcement of demurrage rules. Such laws, in effect,

say to the railways: "You must have an available supply of cars. We will fine you if you do not. Demurrage rules are one means of making cars available. Hence you must enforce demurrage rules."

I have often wondered if the advocates of "reciprocal demurrage" recognize that its adoption must tend toward a reduction of the free time allowed for loading or unloading cars, and an increase of the penalty for the detention beyond the free time. This would hardly be a sweet revenge.

Careful examination will disclose the fact that demands for this grossly misnamed legislation come from shippers so insufficiently equipped with modern means for conducting their business as to compel the infliction of demurrage penalties for delay to cars; and it is clear that if they get what they are asking for they will be sadly disappointed in the end.

If such demands come from honest shippers who feel that they have not received a fair distribution of available cars, I have nothing to say, further than that I think they should find a name for their proposed law that is indicative of their purpose, and that does not tend to discredit in the minds of the unthinking the respectable industry in which I am engaged. And if the demand arose from this source the name would never have been "reciprocal demurrage," and I should not have troubled you with this protest.

A. G. THOMASON,
Demurrage Manager.

RUSSIA TEACHING AMERICA.

St. Louis, April 9, 1909.

TO THE EDITOR OF THE RAILROAD AGE GAZETTE:

Have you noticed that the new minister of the Russian Imperial Railways has set out, disguised, on a six weeks' journey as a third-class passenger over the state railways? He intends to judge at first hand of the discomforts whereof the humble passengers complain, as well as look into other irregularities. Why should not American railway officers follow the example of this Russian minister? Either with or without disguise they could conduct a personal inspection of ordinary passenger train and station service to great advantage.

The officer would find even on the trains de luxe that the smoking compartment of the café car is often so densely filled with smoke that a veteran smoker is willing to exercise some self-denial rather than bathe in such an atmosphere. The kitchen and provision boxes on the dining cars will also bear some inspection, for in such contracted space it is difficult to handle and store large quantities of food in a cleanly manner and to obtain supplies which are always pure and fresh. On the larger lines there is some attempt to inspect the food, and especially milk, but the inspection is apt to be perfunctory and sporadic rather than systematic and continuous. On many lines the heating and ventilation of Pullman sleeping cars has been much improved during the past two years, thanks to good discipline, and they are not now overheated, or too cool, or too close. Why should not this now become the normal condition on all lines?

In the West, competition for passenger traffic has improved the manners and general attitude of the trainmen and agents toward the public, and there is now a noticeable contrast in this particular with conditions on some roads, particularly in the East, where there is no competition, and where railway men have bullied the public so long that it has become a part of their nature. It is in such localities that the officer-inspector incognito might do effective work. He would find that in addition to insolence some old agents are still ignorant of routes and trains, and are unable or unwilling to assist the passenger in determining the best route and proper train. He would find stations in good sized towns or small cities that are in too great contrast with those in larger cities. Many of them are dirty, dull and unsanitary, when with small

expenditure they could be made clean and attractive. The average superintendent, who is usually the highest officer that inspects such stations, seems to be hardened to such conditions and does not notice the dingy walls hung with old circulars, time-tables and maps; and apparently few such officers insist that agents shall keep stations clean and neat. F. M.

Contributed Papers.

RAILWAY MAIL PAY.

BY JULIUS KRUTTSCHNITT,
Director of Maintenance and Operation of the Union Pacific System
and the Southern Pacific Co.

II.

COMPARATIVE RETURNS TO THE RAILWAYS FROM CONDUCTING MAIL, PASSENGER AND FREIGHT SERVICE IN THE UNITED STATES.

In order to make a fair comparison of operating results from different classes of traffic, it is necessary to consider them under substantially similar conditions. The best measure of railway service is work done, or weight multiplied by distance carried; in other words, the ton mileage. A comparison of services differing so widely as the mail, passenger and freight on the basis of ton mileage of such business is, however, unfair, because in the two former an excessive proportion of dead weight must be transported for each ton of paying load, while with freight traffic the proportion of dead weight is small. The hauling power of a locomotive is measured not by revenue ton-miles, but by ton-miles of gross weight, it making little difference to the locomotive what this gross ton mileage is composed of, the gross tonnage and the speed at which it must be moved being the factors that consume the energy of the locomotive.

A computation has been made of ton mileage on each individual mail route by multiplying weight carried by length of route; to the sum of these we add the dead weight of cars. The report of the Second Assistant Postmaster-General for year ending June 30, 1908, page 32, gives the number of cars engaged in mail service, which we have multiplied by the average mileage made by the average car, based on experience of the Union Pacific and Southern Pacific Systems, to ascertain total car mileage for the United States. Multiplying this by the dead weight of a car, gives the ton mileage of dead weight, which, added to the ton mileage of mails, gives the gross ton mileage, measure of work and cost imposed on the railways in return for the pay they receive for handling the mails. These computations are shown in the following statements, the results being conservative, as for want of accurate data it has been necessary to omit some work which the railways do, which, if ascertainable, would increase the cost. For example, we have made no charge for the dead weight of that portion of baggage cars devoted to the handling of pouch mail, such pouch service, according to the Postmaster-General's report, covering annually on railways and express trains 122,027,597 miles; nor for the dead weight of storage mail cars provided by the railways. Neither has any account been taken of the value of transportation given mail clerks, which, based on the Postmaster-General's report of 1908, amounted to 629,778,443 miles, which at 2 cents a mile would be \$12,500,000; nor for the value of transportation or postal commissions of Post Office Department officials; nor does it take into account special service rendered by the railways, such as delivering mail at stations, value of space furnished by the railways and required of them by the Post Office Department at important junction and terminal points for mail distribution and accommodation of government transfer clerks.

The statistics of passenger service in the following state-

ments are based on the 1907 Annual Report of Statistics of Railways published by the Interstate Commerce Commission (1908 figures, which would show higher operating cost, not available), with the exception that the average mileage per car per annum run by passenger cars is based on the experience of the Union Pacific and Southern Pacific Systems.

Statistics of freight service are likewise based on the 1907 Report of Statistics of Railways, freight car mileage being actually reported by the Interstate Commerce Commission, dead weight per car being computed from all freight cars handled on Union Pacific and Southern Pacific Systems.

Mail Service, Year Ending June 30, 1908.

Paid to the railways for railway post office cars.....			\$4,567,366
Paid to the railway for mail transportation.....			43,588,013
Total			\$48,155,379
Ton-mileage of mails handled by railways.....			484,683,135
Pay per revenue ton-mile, including railway postal car pay			9.94c.
Pay per revenue ton-mile, excluding railway postal car pay			8.99c.
	R. P. O.	Apartment.	Total.
No. cars (Post Office Dept. report)	1,342	3,568	4,910
Average length (special mail weighing 1907), ft. mail apartment.	59	27	.....
Equivalent full R. P. O. cars.....	1,342	1,633	2,975
Miles run per car per annum (experience of U. P. System and Southern Pacific Company)...	100,000	60,000	.....
Total equivalent R. P. O. car-miles	134,200,000	97,980,000	232,180,000
Miles traveled by R. P. O. clerks (miles reported as traveled by crews multiplied by average number of men per crews)...	.....	.....	629,778,443
Gross ton-mileage:			
Equivalent railway postal cars, 232,180,000 miles, at 45 tons per car			10,448,100,000
Ton-miles of clerks at 160 lbs. per man.....			50,382,275
Revenue ton-miles of mail, including pouch mail.....			484,683,135
Total gross ton-miles.*			10,983,165,410
Avg weight of mail per equivalent full R.P.O. car, tons*			2.09
" " " clerks per equivalent full R.P.O. car, tons			.22
" " " car per equivalent full R.P.O. car, tons.			45.00
Rate of mail and R.P.O. car pay per gross ton-mile.....			0.4438c.
Ratio of paying to dead load.*			1 to 21.7

*No portion of mileage or weight of storage cars or cars handling pouch mail has been considered.

Passenger Service, Other Than Mail.

	No. of cars*	Miles per car per annum.†	Total car-miles run per annum.
Baggage and express, excluding equivalent postal cars	2,975	7,404	60,000
Sleepers, diners and parlor cars.....	2,000	100,000	200,000,000
Coaches, etc.	31,594	40,000	1,263,760,000
Total	40,998	.....	1,908,000,000
Passenger train-miles, including mixed trains.....			541,439,176
Cars per train-mile: Mail, 0.43; others, 3.52; total, 3.95			
Gross ton-mileage:			
Baggage and express cars, 444,240,000 x 30 tons.....			13,327,000,000
Sleepers, diners and parlor cars, 200,000,000 x 50 tons.....			10,000,000,000
Coaches, etc., 1,263,000,000 x 40 tons.....			50,550,400,000
Total ton-miles dead weight.....			73,877,400,000
Ton-miles of passengers, 27,718,554,030* passenger-miles at 150 lbs. per passenger.....			2,078,891,552
Ton-miles of baggage and express, 444,240,000 car-miles estimated at only 3 tons average load in car.			1,332,700,000
Total ton-miles revenue load.....			3,411,591,552
Total gross tons miles.....			77,288,991,552
Total revenue received from passengers and express.....			\$621,939,274
" " " per gross ton-mile,			0.805c.
" " " per revenue ton-mile			18.23c.
Ratio of paying weight to dead load.....			1 to 21.7

Freight Service.

Total miles run by freight cars*.....	17,122,259,754
" ton-miles dead weight, each car estimated at 15 tons.†	256,833,896.310
" ton-miles revenue freight*	236,601,390,413
Total gross ton-miles.....	510,557,546,477
Ratio of paying to dead load.....	1 to 1.1
Total revenue received for transporting freight.....	\$1,823,651,998
" " " per gross ton-miles	0.369c.
" " " per revenue ton-miles.*	0.759c.
Tons per car revenue freight (loaded and empty).....	13.8
Revenue per car-mile.....	10.5c.

*Statistics of Railways of United States, 1907.

†Experience of Union Pacific and Southern Pacific Systems.

RELATIVE COST OF SERVICE.

To determine the relative costs to the railways of performing mail, passenger and freight service, we must allocate the expenses to freight and passenger service as a whole, afterwards apportioning the latter to mails and other service. Railway operating expenses apply jointly to both passenger and freight trains, so that, with few exceptions, it is impossible to determine exactly from any published statistics the

cost of passenger train service as distinguished from freight. There are some items of train-mile expense directly connected with movement which are less for passenger than for freight trains, while, on the other hand, many other expenses are greater for passenger than for freight, such as danger from casualties, necessity of expensive terminals, delays to other traffic through preference given to passenger trains, additional main tracks, and, particularly, higher standards of maintenance of roadbed required for high speed passenger train movement.

On account of the impossibility of separating the expenses, we assume that the above factors about balance each other and that the average cost of running *all* trains can be taken as either passenger or freight train-mile cost, respectively, without serious error.

We allocate a proportion of the passenger train cost to the mails on the basis of the gross ton-miles handled in each class of passenger traffic.

The relative revenues and expenses are shown below, mail revenues being as shown by the 1908 Report of the Post Office Department, and other statistics as given in the 1907 Statistics of Railways of the United States, published by the Interstate Commerce Commission, or are computed therefrom.

ALL RAILWAYS IN UNITED STATES.

Summary of Mail, Passenger and Freight Service.

	Mails.	Other passenger.	Total passenger.	Freight.
Gross revenue ..	\$48,155,379	\$621,939,274	\$670,094,653	\$1,823,651,998
Operating expenses	96,322,357	677,614,637	773,936,994	974,577,820
Taxes and interest on bonds ...	23,503,973	165,582,552	189,086,525	235,468,467
Total expenses.	\$119,826,330	\$843,197,189	\$963,023,519	\$1,210,046,281
Surplus .....	.....	.....	.....	613,605,711
Deficit	71,670,951	221,257,915	292,928,866	.....
Ton-mileage (thousands)				
Revenue weight..	484,683	3,411,592	3,896,275	236,601,390
Dead weight	10,498,482	73,877,400	84,375,882	256,833,896
Total gross....	10,983,165	77,288,992	88,272,157	493,435,286
Tons dead weight per ton rev..	21.7	21.7	21.7	1.1
Per gross ton-mile, in cents:				
Gross earnings.	0.438	0.805	0.759	0.369
Operating exp..	0.877	0.877	0.877	0.197
Earnings over operating exp. ....	.....	.....	.....	0.172
Operating exp. over earnings.	0.439	0.072	0.118	.....
Taxes and interest on bonds.	0.214	0.214	0.214	0.048
Surplus	0.653	0.286	0.332	0.124
Deficit .....	.....	.....	.....	.....
P. ct. op. exp. to earnings	200	109	115	53
Gross expenses to earnings ...	249	135	144	67

Figures exclude dividends, betterments and additions, etc.

The above shows that while the passenger service as a whole is unremunerative, the mail earnings are hardly half what they should be to pay a fair share of the railway operating expenses only, regardless of taxes and interest.

Or put in another way; our computations have shown that in each passenger train run the railways haul an average of 43/100 of a mail car, and the contents of this car yielded average earnings of 9.4 cents for each mile run. The computation just made shows that each freight car run, loaded or empty, yields a revenue to the carrier of 10.5 cents per mile. Incredible as this may seem, it is understandable when we reflect that the railways transport 1.1 tons of dead weight for each ton of freight for which they are paid; with mail they transport 21.7 tons, or twenty times as much. The freight rate is .759c. per ton-mile, the mail rate 9.94c., or only thirteen times as much.

Arguing in still another way: Average number of cars in each passenger train handled in United States is 3.95, of which mail cars amount to 0.43, or 11 per cent. Eleven per cent. of the average earnings of a passenger train is 13.8 cents, but mail contributed only 9.4 cents. That is, it should pay 47 per cent. more than it does to be made to contribute a fair share to the insufficient earnings of a passenger train. Mails are fairly responsible on basis of space used for 11 per cent. of

the cost of running a passenger train, or 16.17 cents, and as dead weight per foot of space is greater with mails, their proportion of train-mile cost is even larger. They pay little more than one-half this cost.

By building larger capacity cars and larger engines, the cost of handling freight traffic, entirely in the control of the carrier, has been reduced to follow rate reductions and increased expenses.

On the other hand, because methods of conducting passenger traffic are largely—and mail traffic entirely—beyond their control, the cost of handling mail and passengers has been steadily increasing, and, as revenue has not increased, the net revenue or margin of profit has been cut to a point where it is unremunerative.

The argument advanced by advocates of reduced mail pay, that increasing density permitted economies and that lower rates would yield more net, is not applicable when the carriers' hands are tied and measures of economy so successfully applied to handling freight are prohibited. The following will illustrate this:

On routes where pouch service is used mail is handled with express and baggage without much increase of cost over other passenger traffic. A somewhat greater mail traffic obliges the railways to furnish apartment cars, at increased expense and dead weight for the post office feature, but still permitting the railways to carry other traffic in the same car. A still further increase in weight means the establishment of full R. P. O. lines for which the railways receive extra, but inadequate, compensation, these cars being used for no other class of traffic and adding largely to the weight and cost of train service. Even after the route has been made an R. P. O. route, the railways are not permitted to economize by carrying more mail in the car, and as traffic density grows the roads must under the requirements of the Department add more cars, almost in proportion to the business, as the loads carried in R. P. O. cars, as shown by recent special weighing, average only 2¾ tons, and many of them return empty—for which empty haul the railways often receive no pay. When the mail business has assumed very large proportions and the R. P. O. cars have multiplied in ratio therewith, special trains are then added to carry the bulk of the mail, being run at very high speed and adding to the railway expense account in a far higher degree per unit of business than any other class of traffic.

In contrast to the above, baggage and express are very generally hauled in the same and much lighter and less costly car than the mail car, and increase in tonnage is accommodated by hauling greater loads per car. In the case of freight, increased density means larger car and train loads and greatly reduced costs of operating per ton-mile.

Despite these differences in conditions, the automatic scale has secured to the government a larger reduction in mail rates per ton-mile in the last ten years than the percentage of fall in freight rates, despite higher labor and material costs of railway operating. As a result, the mail business—which, according to evidence introduced before the Congressional Committee of 1899, was unprofitable at that time, has been made more unprofitable at the present time by the heavy rate reductions of 1906-7.

As the greatest reduction made deals with mail routes on which traffic is heaviest, a consideration should be given to the following conditions of handling mail on such routes:

HEAVY TRAFFIC MAIL ROUTES.

On very many of the heavy traffic routes where the principal reduction in pay occurred a large part of the mail is now handled in special mail trains run at excessively high rates of speed. Such trains introduce the following conditions:

1. A very much greater liability to accident. A large proportion of the deplorable accidents that have occurred on the American railways in recent years, have occurred to

excessively high speed trains, accidents to such trains being almost invariably destructive to life and property. An examination of serious accidents on the Union Pacific System and Southern Pacific Company for the calendar year 1906 shows that 36 per cent. of the property damage from all causes, including negligence, were traceable to trains not under control and excessive speed, while 30 per cent. additional damage was due to causes that might prevent inferior trains getting out of their way, such as keeping main line on time of superior trains, failure to observe signals or orders, etc.

2. Mail trains run at excessive high speed are much more expensive to operate than other trains, for the following reasons:

(a) Fuel consumption per traffic unit is very much greater at high speed because of diminished tractive power of locomotives.

(b) A relative greater hauling capacity of locomotives must be consumed in moving trains at higher speeds.

(c) Excessive speed requires higher standards of track maintenance, double-tracking, block signals, heavy rail, better ballasted roadbed, etc., etc.

(d) High speed means increased wear and tear on equipment and track.

(e) High speed trains are expensive, delaying and adding to the cost of other traffic.

3. Speed of trains carrying mails has been constantly increased, a study made of the speed per hour made on fastest trains on which R. P. O. cars are handled on seventeen of the principal mail routes, giving the following results:

Average of fastest train on seventeen mail routes:

Year.	Speed, miles per hr.	Relative.
1905.....	42.21	136
1899.....	39.23	126
1890.....	34.35	110
1885.....	31.14	100
Average increase per year, 0.55.		

With the above increase in speed, rates paid the railways have automatically decreased while expenses have largely increased to provide for the above greater speed and because of increase in prices of labor and materials of all kinds in the past five or six years. This increase in speed has been made coincident with growth of freight traffic, which is the railways' profitable business, the non-profitable high speed trains delaying the profitable ones, increasing their cost and incurring liability to accident.

4. Earnings of mail trains supposedly high are not higher than other passenger trains, which, as a whole, earn very much less per mile run than freight, relative figures being as shown by last report of the Interstate Commerce Commission—as 100 is to 218, while the cost of running passenger trains is as much—if not more. This is particularly the case with high speed passenger trains, which is the most unprofitable business in which railways are engaged. (On Union Pacific System last year earnings per passenger train-mile were \$1.71, per freight train-mile \$4.31.)

5. Passenger engines in hauling fast passenger trains on principal main lines at the present time have assumed, on account of increased weight of equipment and excessive speed required, enormous proportions. We now have in such service on our lines engines weighing exclusive of tender 222,000 pounds, this power being 60 per cent. heavier and twice as costly as locomotives used in the same class of service ten years ago, burning double the amount of fuel. Engineers running these locomotives receive higher pay because of the greater size of these engines—to say nothing of recent increases made in their schedules. Such heavy power moving at fast speed is extremely destructive to the roadbed, requiring a much higher standard of maintenance than formerly, maintenance of way cost in the past few years having gone up 50 per cent. Engine failures are largely confined to fast passenger trains and, in general, expenses are increased all along the line because of their introduction.

6. As illustrating the additions to expenses because of increased track maintenance on account of fast passenger and mail trains, we have made a study of statistics, using the Interstate Commerce report of 1906 as a basis, of seven roads having a large proportion of fast passenger service and seven roads having a moderate speed passenger service, but with a large proportion of freight service. On the roads first named the average cost of maintenance of way per mile was \$2,951, and on roads in the latter class \$1,565. The operating expenses per train-mile in the former class were \$1.47, and in the latter \$1.33. The roads in the former class, on account of large number of excessively high-speed trains, were obliged to double-track their lines, which directly increased maintenance expenses.

PAY FOR RAILWAY POSTAL CARS.

The large reduction made by Act of March 2, 1907, in pay for railway postal cars was made in face of large increase in the cost of constructing such cars, due to higher prices of labor and material and greater cost of meeting the more exacting specifications of the Post Office Department. Changing to steel construction, increases in weight, and generally heavier operating expenses, have created an extremely large increase in cost of moving these cars. The standard railway postal car of only a few years ago, 60 ft. long, weighed 80,000 lbs. and cost about \$5,500. The standard railway post office cars, 60 ft. long, of wooden construction, used on the railways with which I am connected, weigh over 100,000 lbs. each, or one-fourth more weight, and costs 40 per cent. more, while our new standard postal cars of steel construction weigh 108,000 lbs. and cost over \$9,000, or 60 per cent. more than the car of a few years ago.

An argument sometimes made in favor of a lowering of R. P. O. car pay is that for apartment cars used in runs where mail density does not require a full car, no additional compensation is allowed. But we feel that a fair consideration of the circumstances under which mail is handled as compared with other traffic will justify the conclusion that this is not an argument in favor of reducing R. P. O. pay, but rather for allowing the railway additional compensation for the apartment cars as well. Both services require the furnishing of special features in the way of traveling post offices not required, except for the convenience of the Post Office Department to enable it to do work while mail is in transit, such as ordinarily performed in office buildings. The full postal car is more expensive to the roads, as it always means additional car service, while in some cases of apartment cars the space not occupied by the traveling post office is adequate to take care of baggage and express, though very frequently this service also means additional car movement that would not be necessary but for the post office feature.

The saving to the railways from reduction in car mileage that would be possible if it were not obliged to furnish traveling post offices, but could use the space occupied by racks and other post office features by loading additional mail in cars, would be many times the revenue allowed for the railway postal cars.

To illustrate: The car mileage of postal cars (changing apartment cars to full cars on basis of length) is 232,180,000 per annum; the ton mileage of mail 484,683,135, or 2.09 tons per car. From figures obtained from the Post Office Department, average car weights shown on page 59, table "EE," special mail weighing of 1907, it is ascertained that storage mail cars, which, of course, contain no post office features, carry an average of 7.04 tons of mail. At this rate the whole mail business could be carried by the movement of 68,844,000 car-miles, or 163,336,000 less than actually employed, due to the post office features. The total railway postal car pay is only \$4,567,366, or only 2.8 cents per additional car-mile, while the operating expenses chargeable to running these 163,336,000 car-miles, or 70 per cent. of the total movement, amount to \$67,000,000.

But for the post office feature, the combined weight of an entire route could many times be handled in a single car such as is used for express instead of several heavy and expensive post office cars, while often extra cars for storage mail must be added, for which no extra pay is allowed, the cost of running these storage cars also not being included in the computation of cost of service, as no accurate statistics of their number or car mileage are available.

In addition to the furnishing of storage cars, although many R. P. O. routes are paid for on a basis of 40-foot cars, it is not economical for the railways to construct such cars which are not interchangeable with other equipment and which would have to be thrown aside if through growth of traffic larger cars are afterwards required. As a result, full 60-foot R. P. O. cars have for years been furnished on many 40 and 50-foot routes, the railway getting no credit for this, while on many other routes R. P. O. cars have been run in advance of the fixing of R. P. O. pay for them.

On a number of routes postal car pay has been allowed for running full cars in one direction only, classing such routes as half-lines. This obliges the railways to move the car in the opposite direction without pay, the small additional compensation of less than 4 cents per mile run received in one direction being entirely inadequate to compensate the road for the empty haul—to say nothing of allowing anything for moving it in the direction for which pay is received. To illustrate: The Union Pacific Railroad in one case between Council Bluffs, Iowa, and Odgen, Utah, 1,003 miles, receives no pay for handling east-bound a 60-ft. mail car, which is paid for west-bound only, six mail cars being required on this line. The R. P. O. pay per car-mile, including movement in both directions, is only 2.24 cents, or about what would be received for transporting a single passenger, although a standard passenger coach has a capacity for 70 passengers.

In connection with the railway post office, an item not often considered is the value of transportation furnished clerks in the railway mail and compartment cars. Figuring this at 2 cents per mile, which is about the lowest passenger fare, the total value of this transportation for clerks in railway post office cars would be \$8,600,000 per annum, or \$4,000,000 more than the railways receive for the handling of these cars, and the value of transportation in the case of apartment cars would be \$4,000,000 per annum additional. In addition to this, a large amount of free transportation is required annually by the Post Office Department for inspectors and other officers of the Department.

The Post Office Department issues annually about six hundred traveling commissions to post office inspectors and other postal officials, and requires railway companies to honor such commissions for free transportation on all trains on all lines on which mails are carried. In some cases these commissions are issued to government officials whose official duties are in no way connected with the transportation of mails on railways. The railways have no control whatever over the issuance of these commissions, and cannot even secure from the Post Office Department a list of them, the Department holding that the list is confidential. These commissions are frequently used for personal travel in violation of the rulings of the Interstate Commerce Commission. In brief, the Post Office Department in effect arbitrarily issued about six hundred annual passes over every mail carrying railway in the United States, which is equivalent to about 200,000 annual passes.

POSTAL DEFICIT.

In investigating the subject of railway mail pay, we have been struck very forcibly with changes which have taken place in the revenues and expenditures of the Post Office Department since 1899, when this subject was last reviewed. Although postal operations still show a deficit, it is a fact that its revenues have increased in a remarkable degree, and the deficit is certainly not due to the amounts paid to the railways for

hauling mail, as these payments are relatively far less now than formerly. Revenues of the Post Office Department have grown from \$102,000,000 in 1900 to over \$191,000,000 in 1908, or 87 per cent., this increase in revenue in eight years being as great as the entire increase in the previous thirty-five years.

But in this same period of eight years there was an increase of \$100,600,000, or 93 per cent., in Post Office Department expenditures, of which only \$10,900,000, or 11 per cent., was paid to the railways, \$33,935,000, or 34 per cent., going to Rural Free Delivery, \$25,000,000, or 25 per cent., to postmasters and their clerks, and the balance to other items, as shown by chart marked "H" herewith.

The following statement shows for the year 1895 and for the years 1899 to 1908, inclusive, postal revenue and postal expenditures divided between amounts paid the railways,[†] cost of rural delivery, and other expenditures:

Year.	Revenue.	Expenditures		
		Paid railroads.	Rural delivery.	Other.
1895..	\$76,983,000	\$31,189,000*	.....	\$57,637,000
1899..	95,021,000	35,775,000	\$150,000	65,607,000
1900..	102,355,000	37,315,000	420,000	70,005,000
1901..	111,631,000	38,161,000	1,778,000	75,616,000
1902..	121,848,000	39,519,000	3,998,000	81,269,000
1903..	134,224,000	41,377,000	8,102,000	89,305,000
1904..	143,583,000	43,971,000	12,682,000	95,709,000
1905..	152,827,000	45,482,000	20,824,000	101,093,000
1906..	167,933,000	46,953,000	24,774,000	106,543,000
1907..	183,585,000	49,831,000	26,643,000	113,754,000
1908..	191,479,000	48,155,000	34,355,000	125,842,000

*Includes \$1,646,741 accrued in favor of Pacific railways in 1895, but not charged to postal expenditures.

Chart marked "Exhibit I" shows clearly that the ratio of expenses to receipts of the Post Office Department would in 1908 have been but 91 per cent. and no deficit but for the expenditures made for Rural Free Delivery, the amount paid the railways being now only 25 per cent. of the total revenue as compared with 41 per cent. in 1895.

In order to avoid a deficit, attention has been concentrated on this 25 per cent. of the postal expenditure, which we contend is at least not an unfair compensation to the railways for services rendered. Though the proportion of the total revenue going to the railways has fallen one-third in ten years, the deficit still remains, and is it reasonable to suppose that any reduction in railway mail pay would not be speedily absorbed in other directions? On the contrary, ought not efforts be concentrated to bring within reasonable figures the other expenses of the Department, which now absorb 84 per cent. of its revenue as compared with only 69 per cent. in 1900—despite an actual growth in postal revenue in the same time of \$89,000,000, or 87 per cent.?

It will be noted from these charts that a reduction of 10 per cent. in the ratio of railway mail pay to total revenue can be entirely wiped out by an increase of only 3 per cent. in other postal expenses, while a retrenchment of 10 per cent. in the latter would have put the Department almost on a paying basis, notwithstanding the heavy cost of Rural Free Delivery. From 1895 to 1908 actual totals show that the railways' pay has increased 54 per cent. for handling 114 per cent. more mail tonnage, while in the same period other expenses of the Post Office Department have grown 178 per cent. revenues increasing 149 per cent.

Increased mail business means a direct increase in postal revenue, as postage remains the same regardless of tonnage, but carrying this increased business on the part of the railways means less proportionate revenue to them according to volume of tonnage, so that the proportion of the postal revenue they now receive is very much less than formerly. Labor, material, and the price of everything sold in commerce have advanced materially, as we all know, in the past seven or eight years; railway mail pay being practically the only thing that has decreased in the face of conditions that should have raised it.

[†]The railways are themselves large contributors to the revenues of the Post Office Department. It is ascertained that nine roads, covering 27,500 miles, pay annually \$261,000 for postage stamps, or at the rate of \$2,000,000 for the entire railway mileage of the country.

As a large increase in mail tonnage means to the Post Office Department about an equal increase in revenue with a decreased payment per ton to the railways through lower rates, the avoidance of a deficit would seem not a difficult matter if other postal expenses were kept at least within sufficient control, so they would not increase faster than the increase in volume of mail handled.

The Post Office Department enjoys this peculiar advantage of receiving with the growth of the country an increase in revenue directly in proportion to the increase in business handled. In disbursing this revenue, it must pay less to the railways in proportion to the density of business, thus retaining to apply on other expenses a larger net revenue year by year. It is reasonable to suppose that the cost of many branches of the Department should not increase in the same ratio as tonnage of mail (for example, that expenses of individual post offices and administrative and general expenses, should not grow in this proportion). Yet, regardless of these favorable influences, expenditures in other directions have absorbed the greater net revenues after paying the railways, and it is in these directions that the cause of the postal deficit must be looked for.

Chart, "Exhibit J," illustrates the growth of these expenditures, which since 1900 has been much faster than the rise in mail tonnage, comparison of 1908 with 1898 being shown below:

	1908.	1898.	Increase.	Per cent.
Ton-mileage of mails handled by roads	484,683,135	272,714,017	211,969,118	78
Postal revenues	\$191,478,663	\$89,012,619	\$102,466,044	115
Less paid railways	48,155,379	34,379,227	13,776,152	40
Net for other expenditures	\$143,323,284	\$54,633,392	\$88,689,892	162
Other expenditures	160,196,507	63,654,297	96,542,210	152
Deficit	\$16,873,223	\$9,020,905	\$7,852,318	87
Per ton of mail handled by railways:				
Postal revenues, cents	39.5	32.6	+6.9	
Paid to railways, cents	9.9	12.6	-2.7	
Net applicable to other items, cents	29.6	20.0	+9.6	
Other expenditures	33.1	23.3	+9.4	
Deficit	3.5	3.3	+0.2	

NOTE.—The increase in gross postal revenue per unit of mail handled by railways is no doubt due to increase in city mail not handled by railways.

RAILWAY CAPITAL AND VALUES.*

BY W. H. WILLIAMS,
Third Vice-President, Delaware & Hudson Company.

(Continued from page 808.)

DEVELOPMENT OF JOBBING CENTER.—The development of a wholesale or jobbing center is dependent, among other things, upon:

(a) The needs of the people as determined by climatic conditions, or the nature of their employment—whether in the mines, in the mills and factories, on the farms, or in the woods—and the ability of their customers to buy what are commonly regarded as luxuries. Each trade center, to attain success, must necessarily be governed by these local conditions.

(b) By the completeness of the market.

The merchants of the smaller towns only buy from the traveling salesman the articles necessary to carry along the trade until they can personally visit the larger trade centers, because of the inability of the salesman to carry with him a complete line of samples and to properly display all the goods. It cannot be expected that the merchant will travel to one trade center for his stock of boots and shoes; to another for his dress goods; to another for his cloaks and wraps; to another for his furs, and to still another for his millinery, when he can save both time and expense by going to one market which will supply all, or nearly all, of his needs. Therefore, the success of the market is proportionate to its ability to furnish any and all articles and of the quality desired. This accounts for the semi-annual pilgrimage of merchants from all points in the United States to the city of

*An address before the New York Traffic Club.

New York to buy their spring and fall stock of goods; New York being the only market having a complete line, both as to class and quality.

(c) Transportation facilities.

This can best be emphasized by an illustration of the work of the Pittsburgh Chamber of Commerce. By reason of the enormous tonnage of the Pittsburgh district, and the extraordinary efforts each railway made to secure at least its fair proportion of the traffic, it is doubtless true Pittsburgh enjoys rates as favorable, if not more so, than those of its competitors. Other jobbing centers, however, were constantly encroaching on Pittsburgh's territory, and an investigation disclosed the fact that other jobbing centers secured earlier delivery for their less carload freight; and in view of this, a determined effort was made to improve the service from Pittsburgh. The tonnage did not justify improved service, but the railways agreed to co-operate with the merchants in an earnest effort to regain that which properly belonged to Pittsburgh. Instead of passing the freight through the various transfer stations en route, each causing a delay of twenty-four hours in time of delivery, the freight was forwarded in through cars, and at the time the improved service to any one city was established, the wholesalers and jobbers of Pittsburgh were notified and they immediately placed their traveling representatives in the territory to solicit orders on the strength of the improved service. The results have been most satisfactory. The less carload tonnage to a number of smaller cities increased from 100 to 600 per cent., and this naturally has been followed by an increase in carload shipments. These results were obtained without any change in the freight rates either from Pittsburgh or the other trade centers. Co-operation has triumphed where individual effort had failed.

A couple of instances will serve to illustrate the point that the question of freight rates is a local one. One merchant complained that the rate from Pittsburgh to Bluefield, W. Va., on the Norfolk & Western, was two cents higher than from Cleveland, notwithstanding the fact that the distance from Pittsburgh was less. Investigation disclosed the fact that the shortest distance by rail was ten miles less from Cleveland than from Pittsburgh, also that Pittsburgh, Parkersburg, Baltimore and Washington enjoyed a lower rate to Norfolk than the rate from Cleveland, while Cleveland enjoyed a lower rate to Bluefield than did Pittsburgh, Parkersburg, Washington or Baltimore. The merchant was informed he could have the Cleveland rate to Bluefield if Pittsburgh would accept the higher rate which obtained from Cleveland to Norfolk. Inasmuch, however, as the tonnage from Pittsburgh to Norfolk is greater than the tonnage to Bluefield, they asked that no change be made.

Another merchant felt aggrieved because the rate from Pittsburgh to Altoona was 33 cents, while the rate from Philadelphia to Altoona was 38 cents, the distance from Pittsburgh to Altoona being only 113 miles, while the distance to Philadelphia was 235 miles. He felt the rate should be proportionate with the distance. Reversing the situation, however, and selecting a station about 113 miles from Philadelphia and about 235 miles from Pittsburgh, it was found the rate from Pittsburgh was 38 cents, and the rate from Philadelphia, 33. The merchant recognized that the existing rates were equally fair to Pittsburgh and Philadelphia.

Were the rates between Philadelphia and Pittsburgh proportionate to the mileage, it would be equivalent to establishing a wall midway between the two cities, and saying to the merchants to the east thereof that they must buy in Philadelphia, and to the west thereof that they must buy in Pittsburgh, and while it might be easier for the merchants of Pittsburgh and Philadelphia to secure their fair proportion of the trade, it would deprive the merchants of the smaller towns of the privilege they now enjoy of being able to buy in competitive markets.

If carried to a logical conclusion, would not a rate structure

based on valuation ultimately lead to a flat mileage rate; and if so, will it not benefit the few dealers in the larger cities at the expense of the many in the smaller cities and villages?

CAPITALIZATION.

Much of the present misunderstanding regarding the relation between the valuation and capitalization of railways and other corporations would be eliminated were it possible to handle the shares of the companies in the same manner as those of joint partnerships. In the latter, each of the partners owns a fractional interest in the partnership, but there is no "par value" assigned to any fractional interest. Each stock certificate of a corporation states that the holder thereof is entitled to shares in the capital stock of the company, but also shows the par value per share. It would, however, be possible, and probably wise, to discontinue showing the par value and only show the number of shares for which the certificate is issued; dividing such number into the total number of shares outstanding would give the fractional interest of the holder. Were this position to prevail, it might cause a discontinuance of the present effort to secure a stock of a par value of \$100, the market value of which will remain at \$100, regardless of any conditions in the money market, and regardless of the earning capacity of the property.

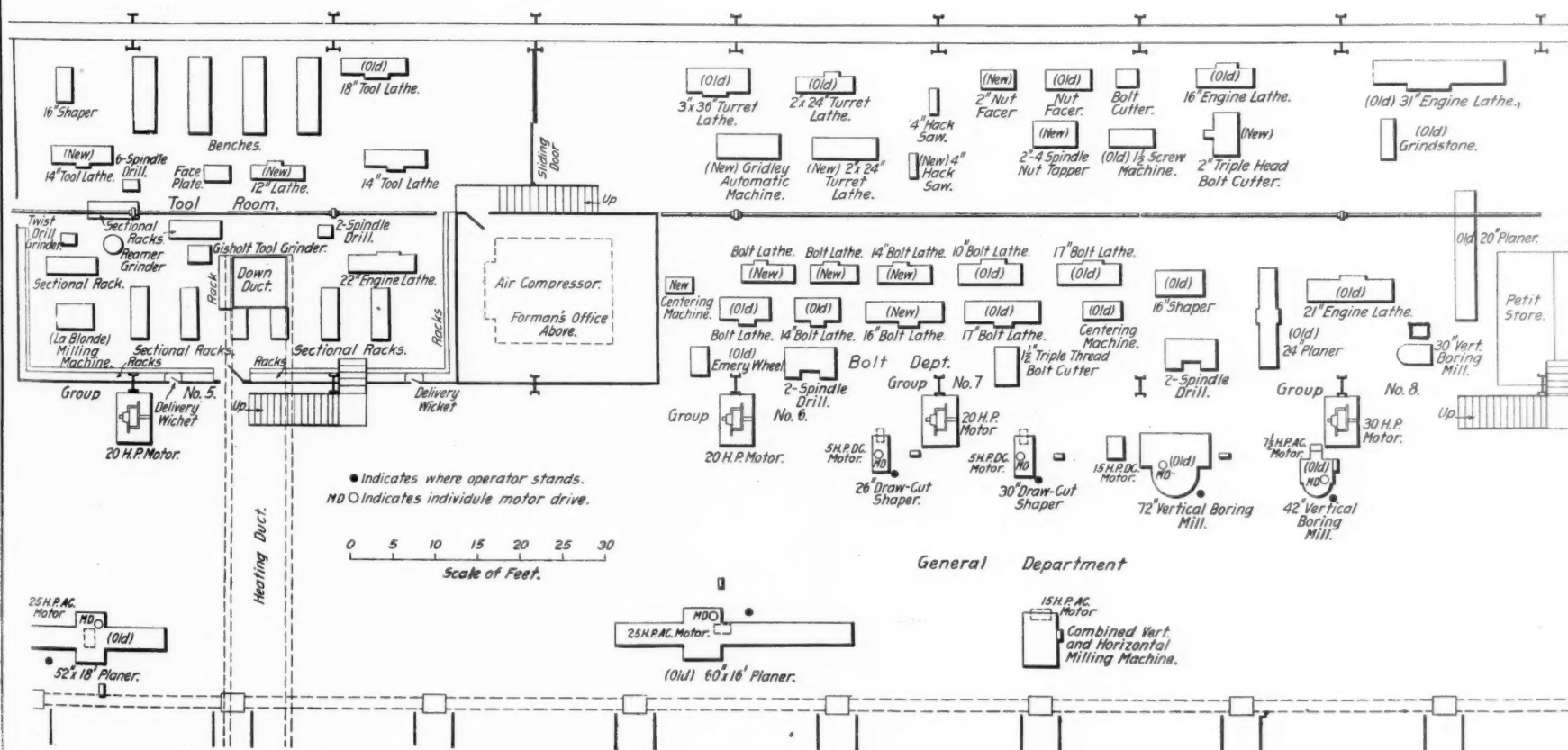
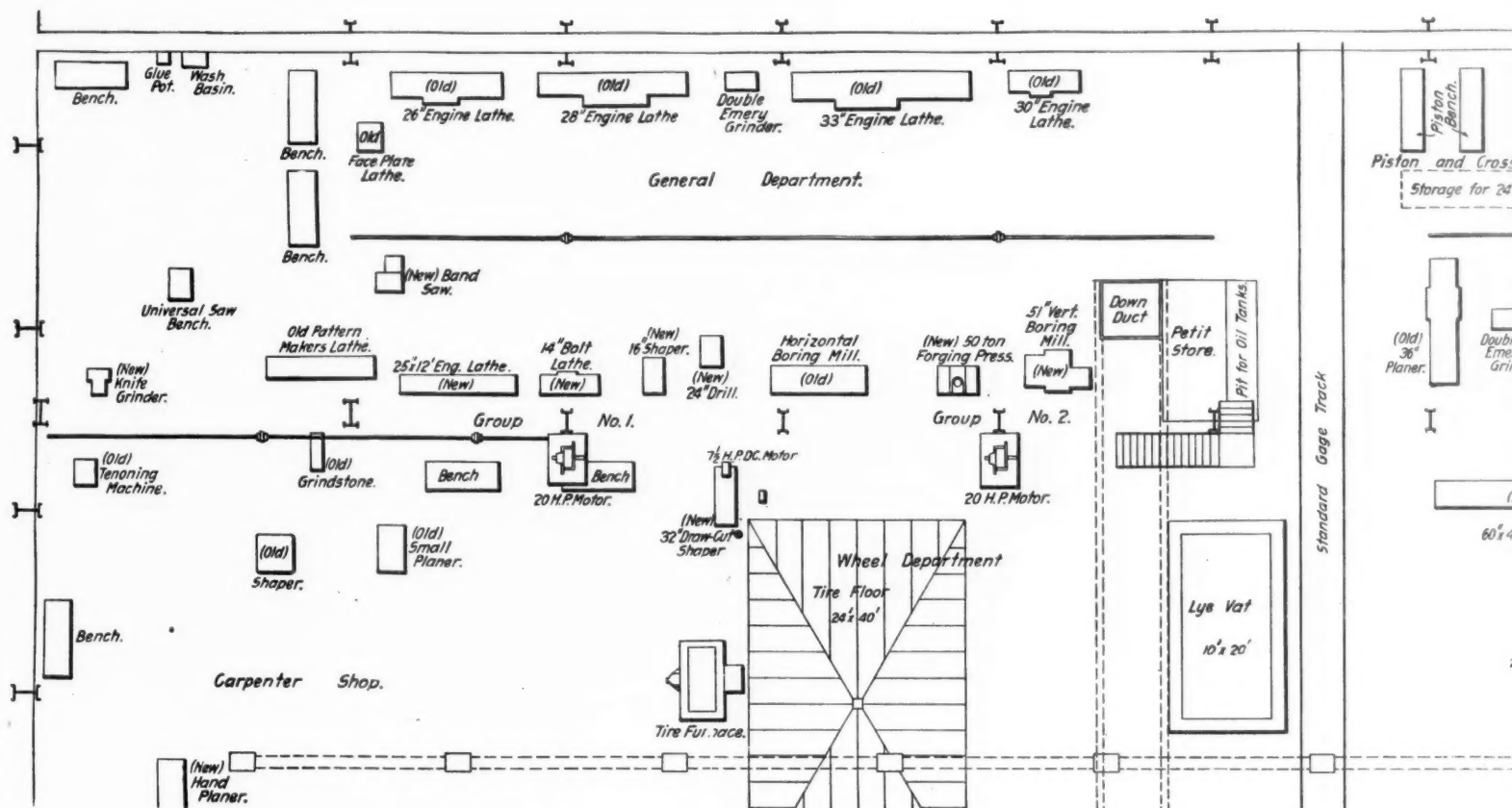
We all know of roads which have been in existence fifty, sixty, seventy, or eighty years, and know of the improvements that have constantly taken place, permitting of more economical operation; and while the return to the stockholder is little, if any, greater to-day than forty years ago, it cannot be denied that the shippers and traveling public have been greatly advantaged by the economies that have taken place, as the freight rates and passenger fares have been materially reduced.

The greater part of the property of the present systems was acquired either through purchase, amalgamation, consolidation, or reorganization of other companies, and the price paid therefor by the present holder, and not the original cost of the material in place, was the basis on which the capital securities of the existing companies were issued. In some instances this may have been at thirty or fifty cents on the dollar, and in other cases at two dollars for each one dollar originally invested. The price paid was dependent on the then value as a "going concern," and this, of course, was affected by the condition of the property, its strategical location, its earning capacity, and its probable enhanced value to the new owners by reason of control of traffic thus secured to other lines owned by the purchaser.

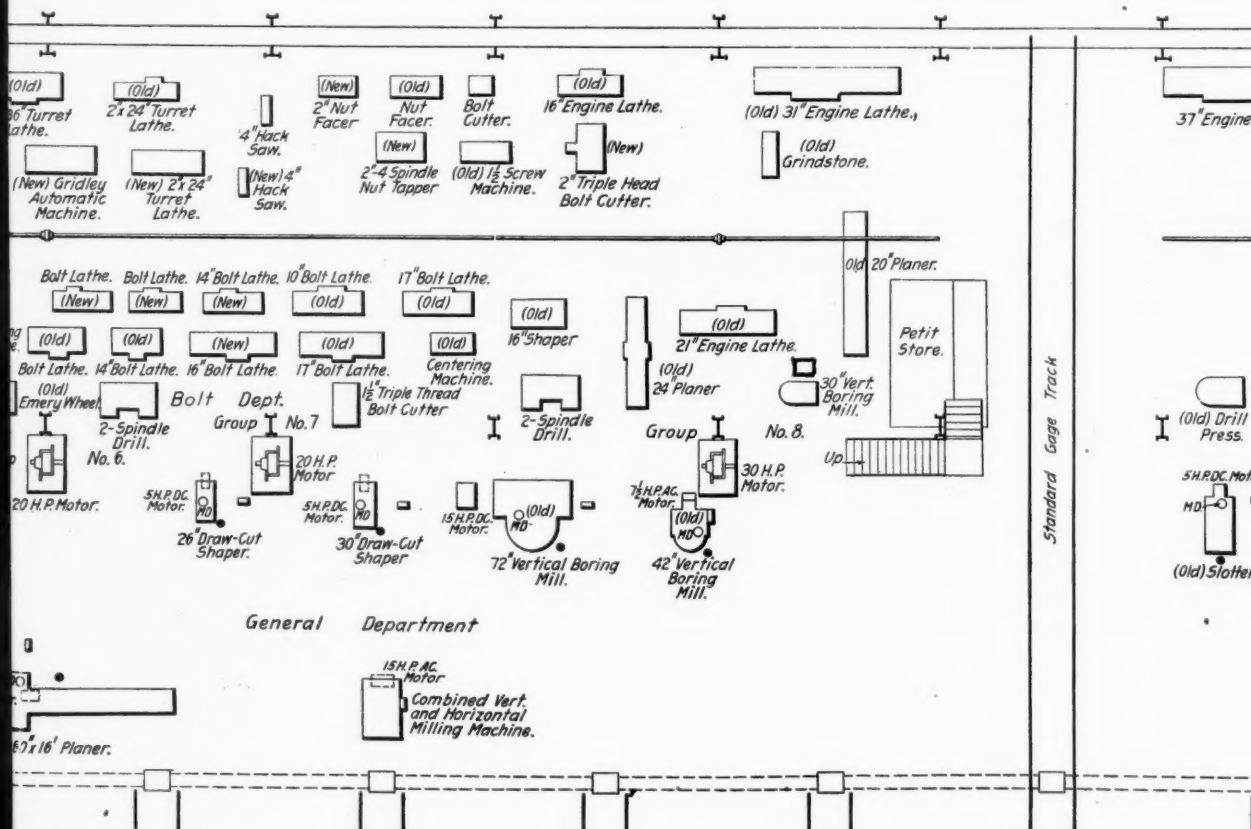
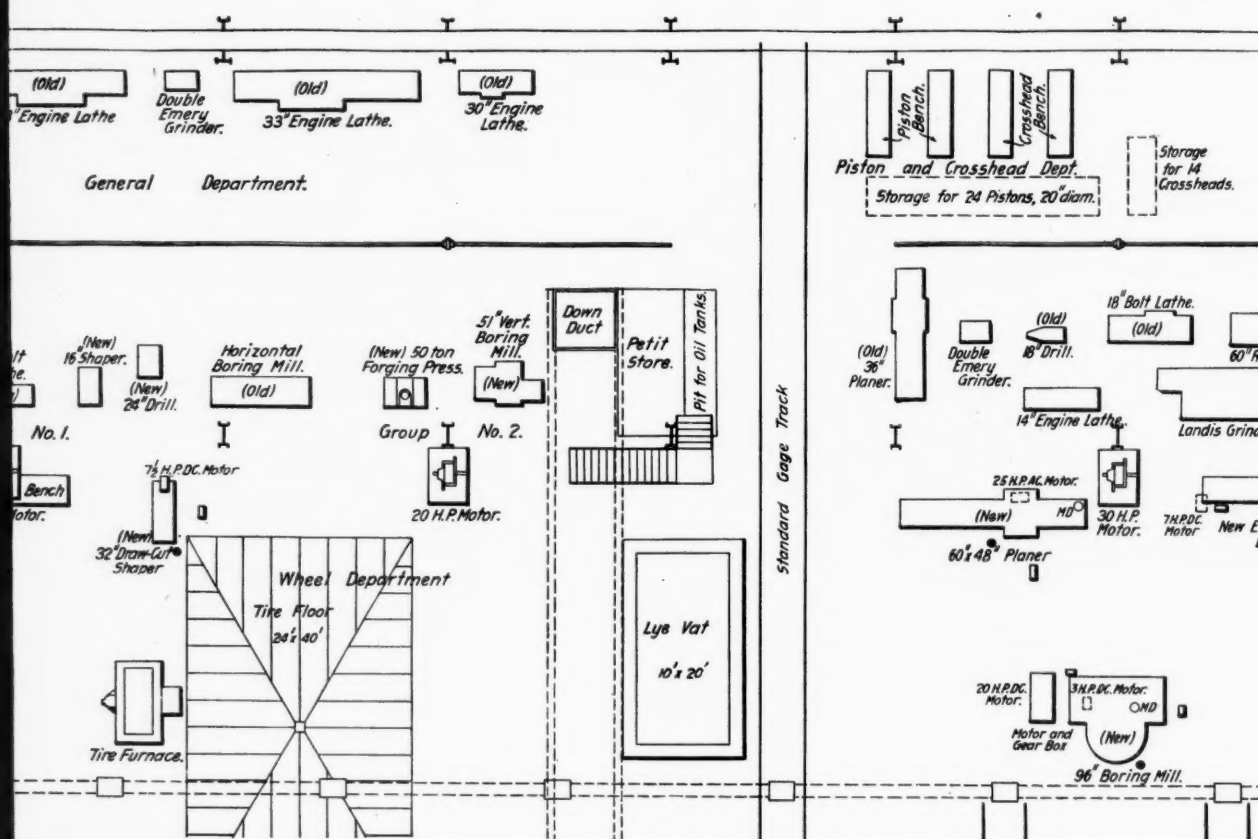
Certainly it cannot be denied that a road between New York and Chicago, 950 miles in length, passing through a manufacturing district, is of greater value than a road 1,200 miles in length, between the same cities, but passing through a hilly and undeveloped territory a portion of the distance, and through a farming section for a greater portion of the remaining distance; yet the advocates of a physical valuation would have us believe that there is no difference in the value of the two if they can be reproduced to-day at the same cost. They unfortunately overlook the fact that it was not only the early construction of the shorter line, but its progressive management working to secure the location of new industries and build up those already established on the line, that had secured for it the commanding position it holds to-day. The success of these industries was in a measure dependent upon the service rendered on the road; any enhancement in value by reason of their location on the road would probably be construed by the courts as something which must be reckoned with in determining the "fair value" of the carrier's property.

We have already seen how the present companies came into existence, and why there cannot be established any reasonable proportion as between the percentage of material in place and the cost of road and equipment as it appears on the company's books.

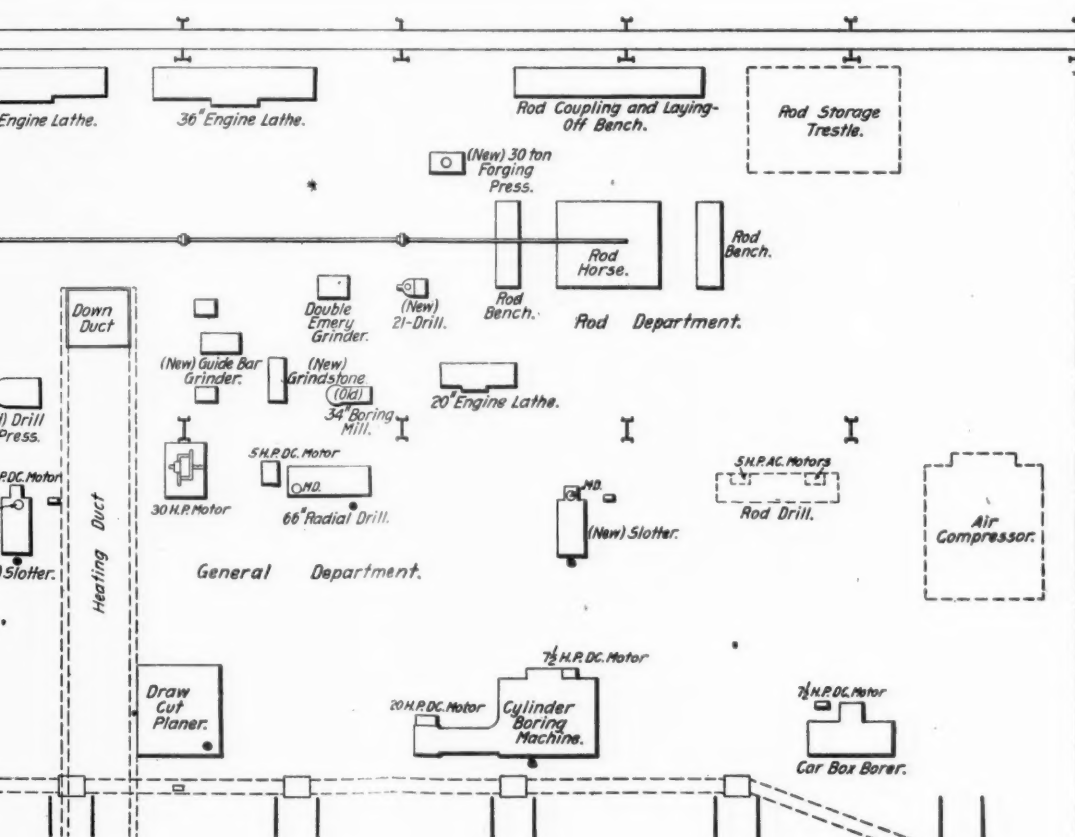
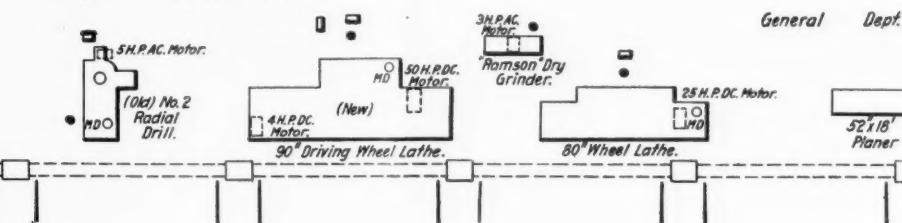
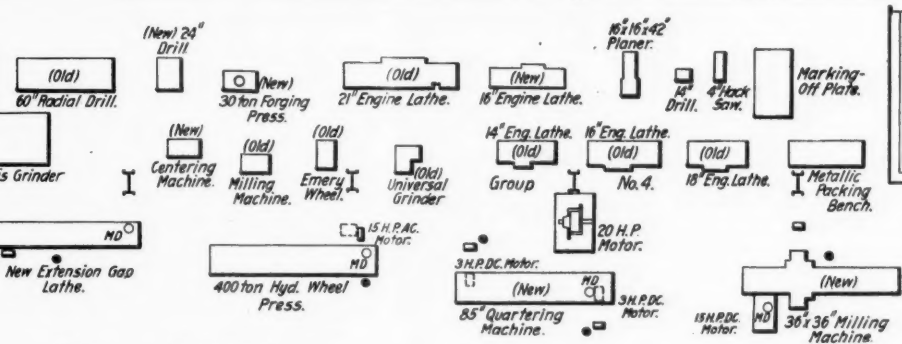
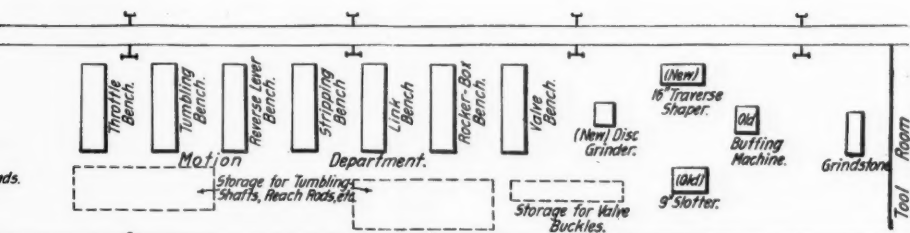
(To be continued.)



General Arrangement of Machine Shop; Battle Creek Shops



General Arrangement of Machine Shop; Battle Creek Shops of the Grand Trunk.

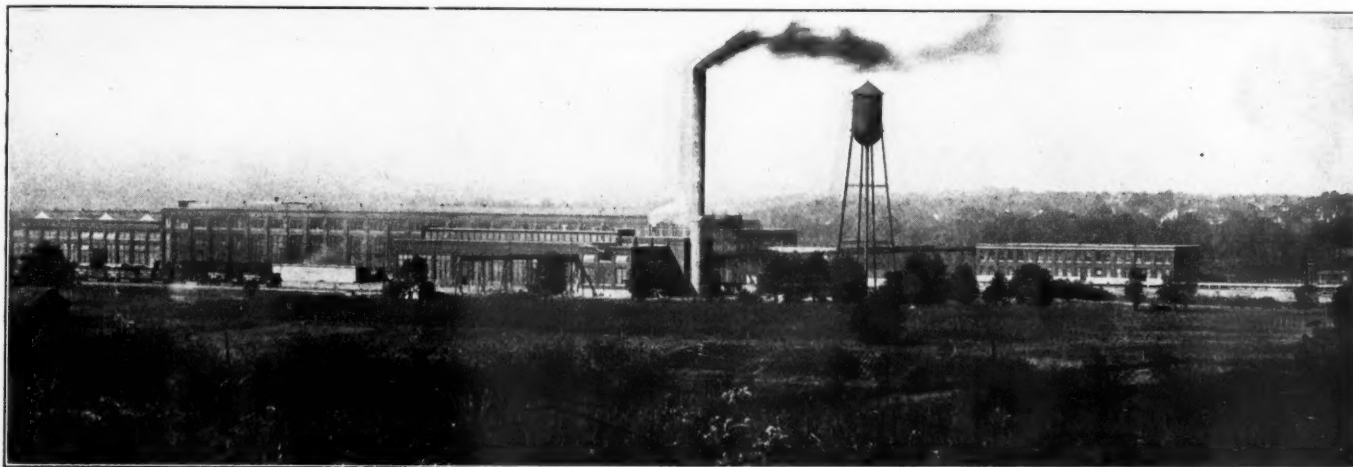


NEW LOCOMOTIVE REPAIR SHOP OF THE GRAND TRUNK, BATTLE CREEK, MICH.

[WITH AN INSET.]

The shops for the care of locomotives on the Grand Trunk system west of St. Clair river were removed from the old buildings at Port Hope to the new shops at Battle Creek the first of October, 1908. There are now 260 locomotives tribu-

general layout provides for a future extension of 100 per cent. to each building in such a manner that the area for extension is not between the structures, as in that case it would be necessary to carry material from different departments over this additional area. Ample provision has also been made for car shops, which are to be located east of the present buildings. The power house is located at the extreme east side of the locomotive shops so as to be central when

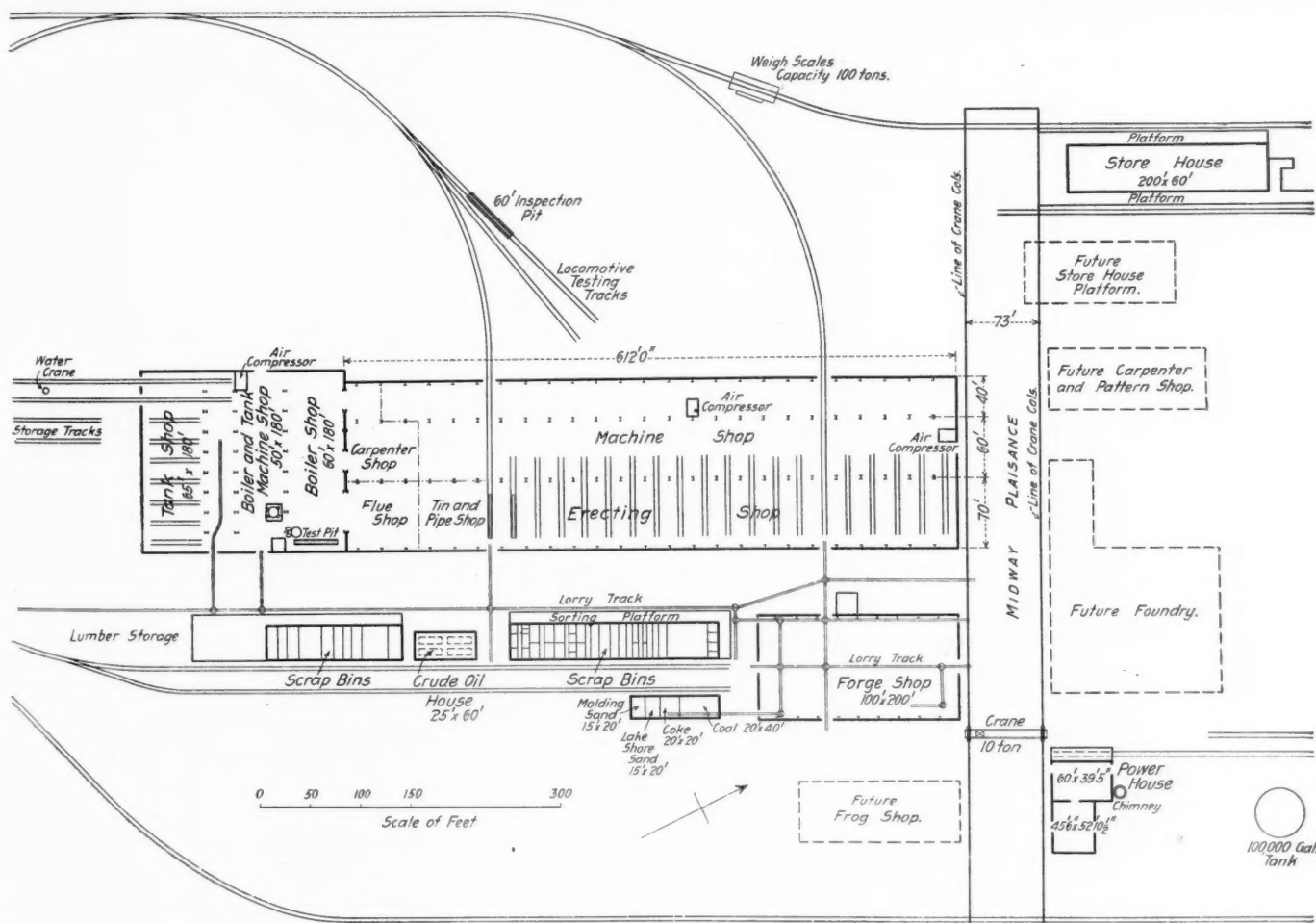


General View of the Battle Creek Shops.

tary to this division. The erecting shop has 25 pits, 18 of which are now in use, and the plant is turning out engines with light and heavy repairs at the rate of two engines per pit per month.

The general plans and cross sections of the large buildings were illustrated in *The Railway Age*, March 8, 1907. The

the car shops are erected. The 75-ft., 10-ton, outside traveling crane serves all the shops, the storehouse and the platform which is used for the storage of heavy material, castings, etc. A future foundry, carpenter shop and pattern shop will be located on the north side of the crane runway opposite the large locomotive shop, and a frog shop will be built parallel



General Layout of Shops and Tracks; Battle Creek Shops of the Grand Trunk.

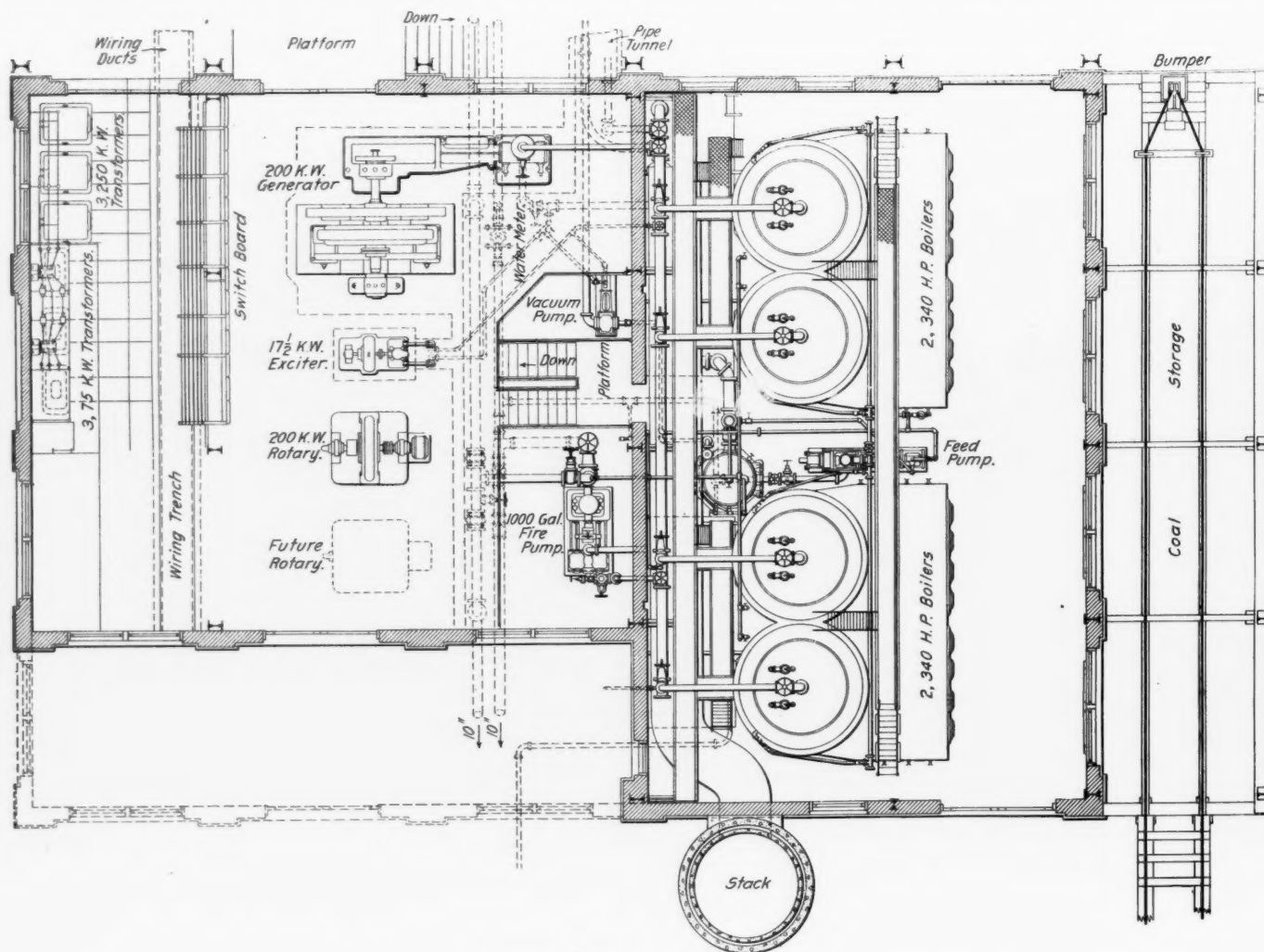
with the blacksmith shop and opposite the power house. All the buildings are parallel to the main line and all the yard tracks to the buildings connect with the main line so as to give through movement of material to and from the shops.

POWER HOUSE.

The power house is a handsome, substantial building with concrete foundation, which is carried up to a height of 5 ft. above the ground, and which supports the steel structure with its colonial shale brick walls and flat composite roof of asphaltum. The floors throughout the building are of concrete. The power house is not large, as the bulk of the electric power is purchased. The boiler equipment consists of 4 Wickes boilers, each 340 h.p. Coal is dumped into the bunker directly from the cars and fed into coal chutes, which are conveniently arranged before each firebox, and the labor of

ground concrete tunnel covered with movable concrete slabs, which extend slightly above the surface of the yard and form a convenient footwalk down the midway.

In connection with the water system there is a storage tank of 100,000 gal. capacity with a hemispherical bottom. It is supported on a steel structure 125 ft. high, the total height to the top being 165 ft. The water pipes pass through the power house, and the piping valves are so arranged that the shops can be supplied either from this tank or from the city mains, and water can be pumped by a fire pump into the tank or from either the tank or the city mains into the shop water system. This pump is a Worthington fire pump with a capacity of 1,000 gallons a minute, and capable of maintaining a pressure of 75 lbs. There is a vacuum pump connected with the return from the heating system which reduces the



General Plan of Power House.

stoking is thus reduced to a minimum. The chimney is made of concrete with an air space; it is 175 ft. high and 9 ft. in diameter inside, and is large enough to permit of a considerable increase in the boiler plant when more power or steam is required. The chimney was built by the Metal Concrete Chimney Co., St. Louis, and is a fine example of smooth concrete work. The cost is said to have been 25 per cent. less than an equivalent brick chimney. High pressure steam is supplied to the engine room for power, to the forge shop to operate the steam hammers, to the locomotive shops to drive the heating fans and for boiler testing purposes, and to the office and store where it is reduced in pressure and used for heating purposes. Low pressure exhaust steam—and when this is insufficient steam reduced from high pressure—is used to heat the large locomotive and forge shops. The steam piping leading to the different buildings is suspended in an under-

pressure in the return pipes to an equivalent 10 in. of vacuum. These two pumps are placed in the engine room on the floor below the level of the main room.

In regard to electric power, after careful consideration it was decided that it could be purchased more economically than generated. Power is therefore obtained from a hydro-electric plant at Jackson, Mich., 45 miles distant, which delivers it over a 3-phase 60-cycle 5,000-volt a.c. transmission line, provided, on entering the power house, with necessary lightning arresters. In the shops direct current at 220 volts and alternating current at 440 volts are used. To meet these requirements, there are two banks of transformers in the power house, one composed of 3 single-phase 250 kw. transformers by means of which the voltage is stepped down from 5,000 to 440 volts; and the other consisting of 3 single-phase 75 kw. transformers. A 250 kw. rotary converter is provided for

the desired 220-volt direct current. A small induction motor is used to bring this converter up to synchronous speed.

The main generator in the power house is a 200-kw. 440-volt 60-cycle 3-phase machine driven by a 300-h.p. simple non-condensing Corliss engine. There is also a generator exciter driven by a small vertical engine. This generator can be used to avoid complete shut-down in case of trouble with the transmission line or the generating plant. As more exhaust steam than that obtained from the fan engines and steam hammers is required for heating purposes in cold weather, it is profitable to utilize the live steam from these engines for heating. All the electrical apparatus in the power house was manufactured by the Westinghouse company.

The high tension apparatus, which can be operated from the switchboard by means of remote control switches, is located on two balconies, one above the other, beneath which the transformers are situated. In front of these and facing the balconies is the switchboard, and before it are located the generator, exciter and converter. Connected with the switchboard are two sets

employed, colonial shale brick being used on the outside face. The roof covering is felt and tar with the usual covering of gravel. The shop is well lighted by skylights and the surrounding windows of the clear story of the erecting shop, while the roof lighting of the machine shop is furnished through windows arranged saw-tooth fashion. The flashings and ventilators are of copper, and water from the roof is conducted to the sewer by 4-in. pipes inside the building, placed at intervals of 24 ft. Particular attention has been given to the lighting feature of the shop, and instead of ordinary window glass, corrugated glass was adopted. While this is not clear enough to distinguish objects outside, it produces a better diffusion of light and almost entirely eliminates shadows, preventing much of the annoyance due to direct sunlight. The interiors of the buildings are painted white and produce an excellent reflecting surface. While no pretense to ornamentation enters into the design of this building, yet it is clean-cut and presents an imposing appearance. A balcony extends along the machine shop side having a length of 588 ft. and a width of 40



Interior View of Erecting Shop.

of a.c. bus-bars carrying 440 volts, one set for the generator and the other for the purchased power, and also the buses for the 250-volt d.c. circuit. The switchboard comprises the necessary panels for the control of the converter, the d.c. and a.c. generator and purchased power lines, as well as six a.c. and two d.c. feeders. The a.c. feeders are so connected that they can be thrown on either the generator or the purchased power buses. Beneath the floor behind the switchboard is a tunnel built of concrete; passing through this the feeders are carried in lead-covered cables through clay conduits from the power house to the fuse panels in the shops. Branches to motors and lighting circuits are connected to the feeders in surface boxes.

ERECTING AND MACHINE SHOP.

The erecting and machine departments are under one roof in a large building constructed of steel, concrete and brick, being of the self-supporting type and having floor dimensions 170 ft. x 612 ft. The concrete portion of the walls rises to the level of the window sills, from which point to the roof brick is

employed, colonial shale brick being used on the outside face. The roof covering is felt and tar with the usual covering of gravel. The shop is well lighted by skylights and the surrounding windows of the clear story of the erecting shop, while the roof lighting of the machine shop is furnished through windows arranged saw-tooth fashion. The flashings and ventilators are of copper, and water from the roof is conducted to the sewer by 4-in. pipes inside the building, placed at intervals of 24 ft. Particular attention has been given to the lighting feature of the shop, and instead of ordinary window glass, corrugated glass was adopted. While this is not clear enough to distinguish objects outside, it produces a better diffusion of light and almost entirely eliminates shadows, preventing much of the annoyance due to direct sunlight. The interiors of the buildings are painted white and produce an excellent reflecting surface. While no pretense to ornamentation enters into the design of this building, yet it is clean-cut and presents an imposing appearance. A balcony extends along the machine shop side having a length of 588 ft. and a width of 40

ft. On this balcony are situated three heating fans having a total of 43,500 lineal ft. of 1-in. steam pipe coils. The heated air passes through down ducts and enters the concrete tunnels under the main floor; these tunnels lead to the diffusers along the wall which are slightly above the floor level. In this way the shops are not only comfortably heated, but a perfect circulation of air is satisfactorily maintained. A 60-h.p. engine drives each of these fans, the exhaust steam passing through the coils.

There are also located on the balcony toilet rooms and lavatories of approved design, and a supply of hot and cold water is provided. Individual lockers of the hospital type are placed along the walls of the lavatories. Metal urinals, which are also sanitary in design, are located on the ground floor at the columns on the dividing line between the erecting and machine shop bays. The shop floor is made of hemlock sleepers spaced 4 ft. apart in well tamped sand; and these are covered with 3-in. x 6-in. yellow pine.

In the erecting bay, which is 70 ft. wide by 612 ft. long, are



First Locomotive Into New Shops for Repairs.



Heavy Machine Bay; Grand Trunk Shops at Battle Creek.

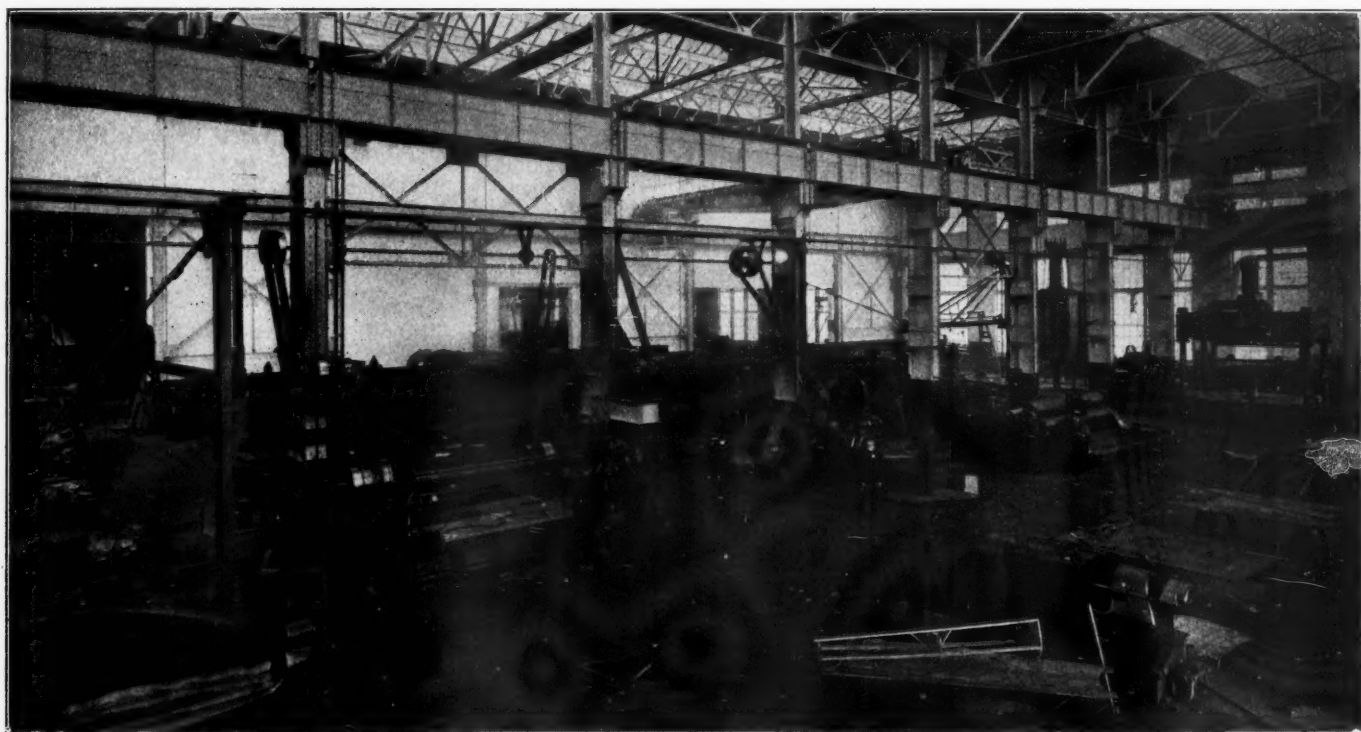
25 engine pits, each 43 ft. in length and having a space allowance of 24 ft. between centers. Extending along the sides of each pit are recesses in which are hung air pipes and wire conduits. The former have connection with pneumatic tools. In the latter are two plug receptacles to permit of the use of extension incandescent lamps. Water and steam pipe valves are placed at the back end of each pit to be used in connection with the customary boiler tests. Between each two pits is a work bench attached to which are two extension lamps similar to those in the pits. Each of the benches is equipped with two heavy vises. All the supporting columns adjacent to the back end of the pits are provided with air pipe connections and plug receptacles which prove of great convenience.

The erecting bay is equipped with two electric cranes, one 120-ton and the other 10-ton capacity. These are supported on separate runways attached to the steel frame of the building. The larger crane has ample head room to carry a locomotive the entire length of the shop over the others, while the smaller crane is used in the work of stripping and erecting the various parts of the engines. All the traveling cranes were supplied

order: Commencing 24 ft. from the west end, wheel and truck; piston and crosshead; valve motion; tool room; bolt and rod department. The tin, paint, air brake, brass finishing, machine repairs, belt and electrical departments are located on the balcony floor, which is made of reinforced concrete 6 in. thick. In order that each of the above departments may be self-sustained a sufficient number of machines of various types has been allotted to each, thus obviating the frequent handling of the work. In the central part of the machine shop there is a concrete and cement lye vat, 20 ft. long, 10 ft. wide and 10 ft. deep. This was made large enough so that a complete pair of driving wheels with their boxes, eccentrics and rods can be immersed in the lye and cleaned. They are easily handled for this purpose by the overhead electric crane. A small motor driven exhaust fan carries the fumes from this vat to the outside of the building.

BOILER AND TANK SHOP.

These departments are located at one end of the machine and erecting shop at right angles thereto, being constructed on lines similar to those of the erecting shop, and have floor

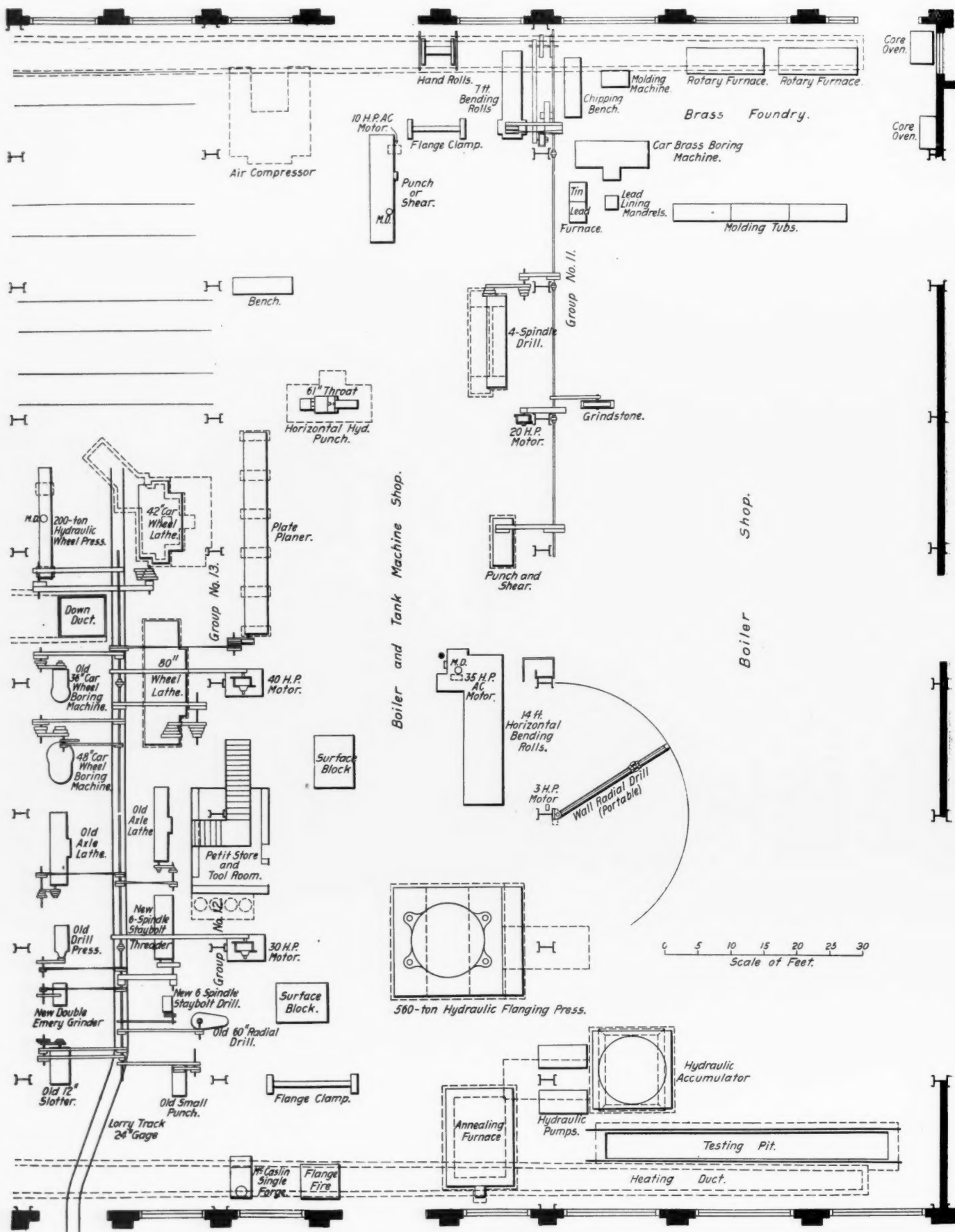


Boiler Shop.

by the Morgan Engineering Company, Alliance, Ohio. Motor driven double emery wheels are placed along the walls and immediately in front of the locomotives, and assist materially in saving time on the various portions of the work. There are two tracks which enter the shop, one opposite the sixth pit from each end of the erecting shop. These are used for convenient transfer of engines to and from the shops. At one end of the erecting bay five pits are temporarily covered over, that portion being allotted to the pipe and tube department. A motor driven pressure-blower delivers a 14-ounce blast to these departments.

Running parallel with the erecting bay is located the heavy machine tool section of the shop. This section is 60 ft. wide and 212 ft. long. It is not at present entirely used for machine tools, about 120 ft. being occupied by the carpenter shop. The entire length of this section is also served by a 10-ton traveling crane. Most of the machines in this section are driven by individual motors. With the exception of the wheel and truck department and a majority of the larger tools, the other departments embraced within the machine shop on the ground floor are arranged under the balcony in the following

dimensions 180 ft. x 205 ft. A brick curtain wall separates this shop from the erecting and machine shops, which prevents much of the noise from riveters extending beyond the boiler shop. An opening, however, admits of the transfer of boilers to and from the erecting shop, the boilers being passed through by means of a truck with a revolving top. The main boiler bay is 60 ft. x 180 ft., has ample capacity to accommodate nine boilers at one time, and is covered by a 30-ton double trolley crane. In the boiler machinery bay which has dimensions 50 ft. x 180 ft. an accumulator capable of exerting water pressure of 1,500 lbs. per. sq. in. has been installed. This is supplied by two motor driven pumps adjacent to it. The hydraulic tools consist of a large four post flanger and a horizontal punch having a 60-in. throat. In addition to these there are in the forge shop two heavy shears, a large punch and a bulldozer, which receive power from this plant. The riveting tower has not yet been equipped with its relative machinery. The pump for the accumulator was furnished by the Goulds Mfg. Co., Seneca Falls, N. Y., and is driven by a 40 h.p. three-phase motor. The Ferguson oil furnaces, supplied by the Railway Materials Company, Chicago, are used throughout.



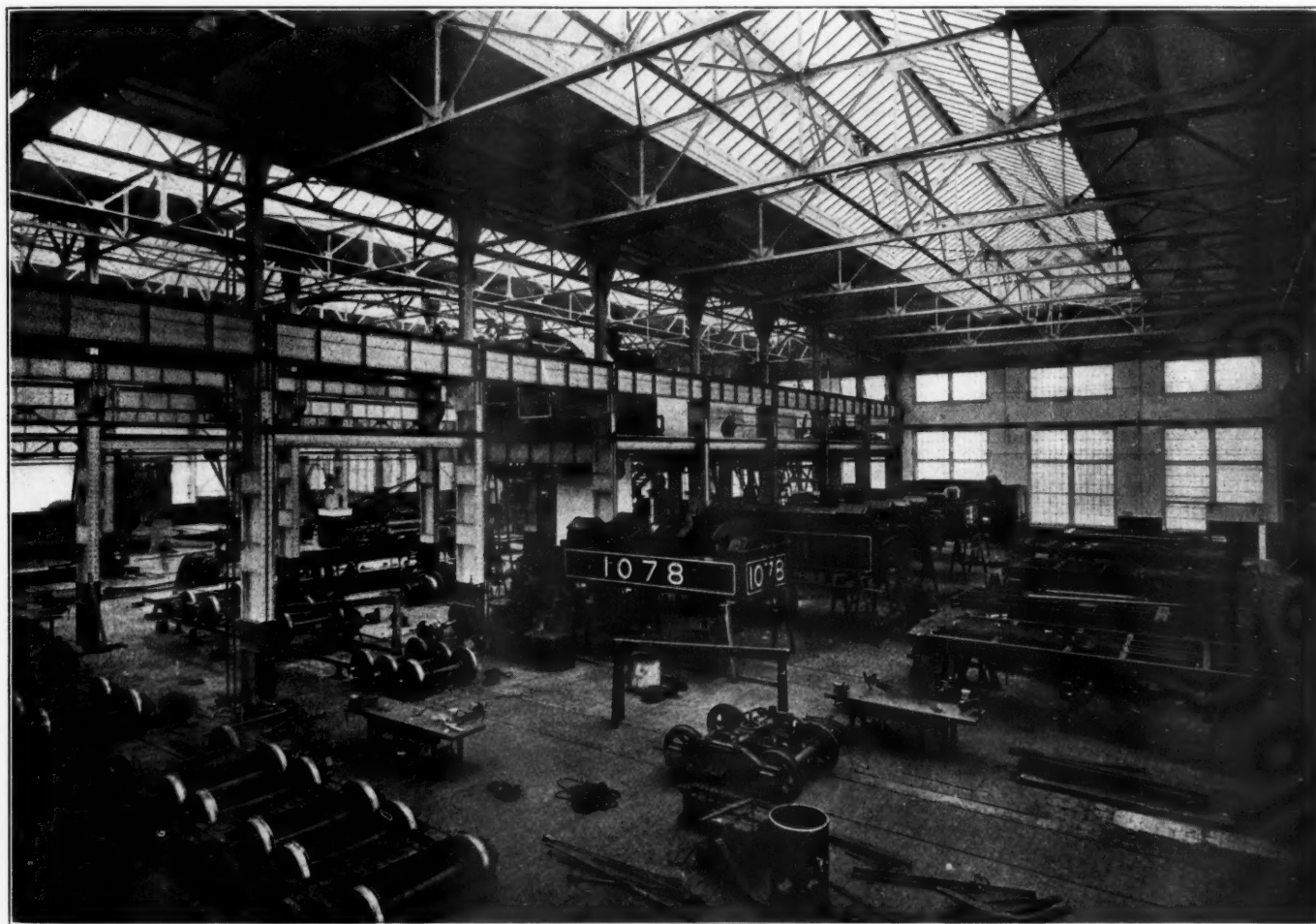
General Plan of Boiler Shop and Boiler and Tank Machine Shop.

The rolls were furnished by the Niles-Bement-Pond Company, New York, and are driven by a 35-h.p. motor. Williams & White, Moline, Ill., furnished the large shear, and the hydraulic riveter was supplied by R. D. Wood & Co., Philadelphia. A large annealing furnace forms a part of the equipment of this department; also a motor-driven splitting shears and punch. The brass department is at present located in a portion of the boiler shop and it is equipped with a duplex melting furnace, heated by oil fuel, made by the Rockwell Furnace Co., New York. Near this is a large 4-spindle boring machine for finishing bearings, built by the Niles-Bement-Pond Company, and this machine is driven by a 7½-h.p. motor. A 10-ton overhead crane and several jib cranes facilitate the handling of the work in this bay.

The tank shop is divided into two bays running parallel with each other, one in which truck wheels and axles are dealt with

FORGE SHOP.

The forge shop is 66 ft. east of the machine and erecting shop with the north end on the yard crane runway. The building has a self-supported steel frame with brick curtain walls, composition roof and cinder floor. The floor space is 100 ft. x 200 ft. and the height 24 ft. from the floor line to the bottom of the roof trusses. The building is divided into ten bays of 20 ft. each. The windows are 15 ft. 8 in. wide and extend from the concrete water table to the bottom of the roof trusses. The center of the roof has a monitor 10 ft. high and 20 ft. wide, with a pivoted sash, mechanically operated for ventilation and light, and this with the wall windows gives excellent lighting. Ribbed glass is used, which diffuses the direct rays of the sun so that men working close to the windows are not inconvenienced when the sun shines directly on the sides of the building.



Battle Creek Tank Shop.

and the other dealing with repairs to frames and tanks, the tank bay having a floor space of 65 ft. x 205 ft., which gives ample room to place a tank and a frame on a single stall. A 20-ton double trolley crane is employed in this bay. The machine bay of the boiler shop has a floor space 30 ft. x 205 ft. Half of this bay is traversed by a 5-ton single trolley crane. The remainder is provided with a balcony, on which are located toilet rooms, lavatories and lockers, and in addition there is a hot blast fan for heating, with coils containing 15,500 lineal feet of 1-in. pipe. On each column in this building there are drops and lighting receptacles similar to those described in the machine and erecting shops. In the locomotive, boiler and tank shops, offices for the foreman have been provided. These are elevated above the floor in a second story, thus commanding an unobstructed view of the entire shop. The floor underneath is occupied by the air compressors.

The toilet and locker rooms are located in a small wing, 20 ft. x 21 ft., two stories high, the first story for closets, urinals and shower baths, and the second for lavatories and lockers. All steam piping is carried in an underground tunnel in the center of the building to and from the steam hammers. The oil and water piping is carried underground in pipes laid in concrete and high pressure air pipes in roof trusses with outlets on columns. All material in this shop is handled by jib cranes and cars on a 24-in. industrial track, which serves all parts of the building. The coal and coke sheds are located just south of the shops and the industrial track runs into them, so that coal can be taken to all forges on a small car. The draft for all furnaces and forges is furnished by the American Blower Company's (Detroit, Mich.) blower, directly connected to a 100-h.p. induction motor. The air piping is galvanized iron and is carried overhead to forges and furnaces, except where

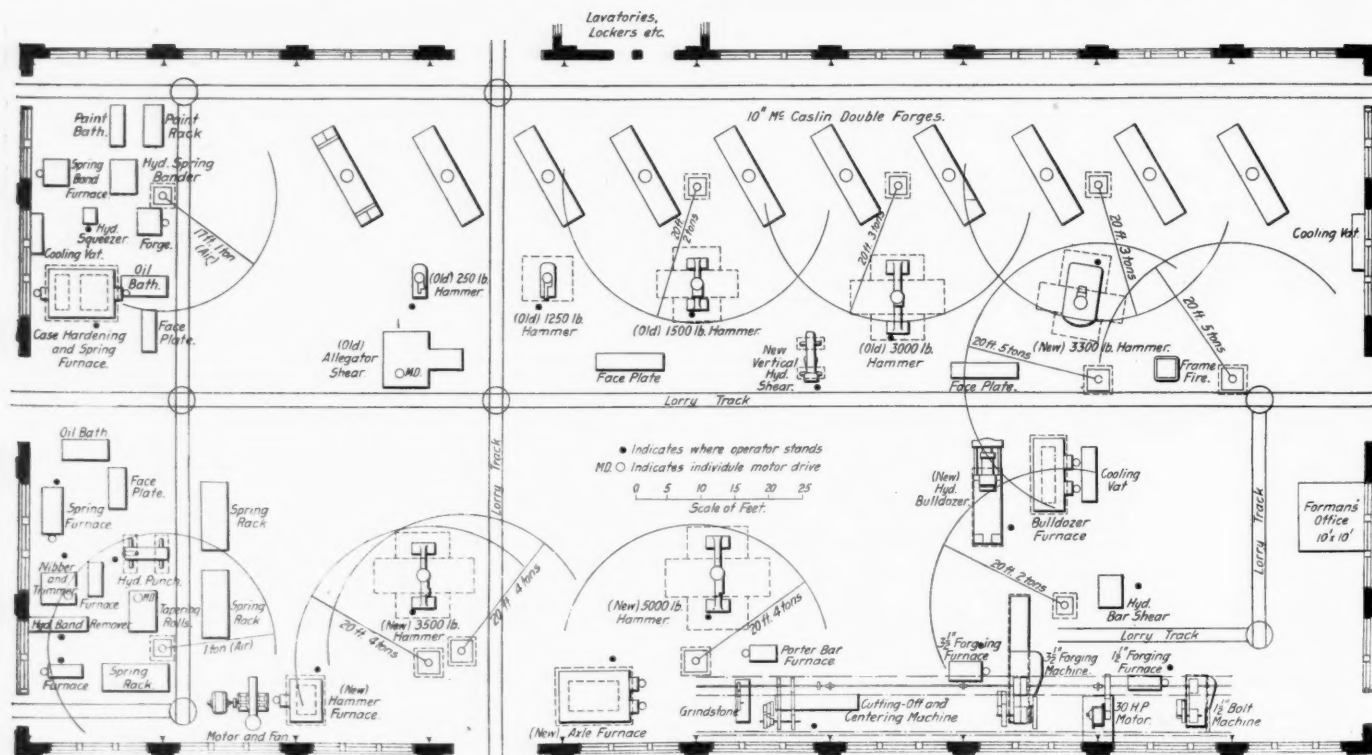
the down pipe would interfere with the jib cranes, when it is brought down along the wall and underground to furnace of forge. There are 10 McCaslin double forges on the west side of the building. All light work is done on the side next the wall while the inside floor space is occupied by 7 hammers which range from 250 lbs. to 3,300 lbs. Near the north end of the

forges in the center of the building is placed a special fire, which is raised and lowered by air; this is used for welding frames and is close to a 3,300-lb. single frame hammer, both of which are covered by a jib crane and a yard crane for handling engine frames.

The hydraulic bulldozer, the hydraulic bar shear, the $3\frac{1}{2}$ -in.



Forge Shop.



General Plan of Forge Shop.

forging machine, the 1½-in. bolt forging machine, with their oil furnaces, are located in the northeast corner of the shop. Just south of this on the east side of the building is the axle department with axle furnace, 5,000-lb. hammer and double cut-off and centering machine. This machine and the two forging machines are run by a 30-h.p. group motor. The 3,500-lb. hammer and furnace are located just south of this and take care of the heavy forge work.

The spring department is located in the south end of the shop and contains the nibber and trimmer, tapering rolls with individual motors, a hydraulic punch and hydraulic spring bender with suitable furnaces conveniently located. There is a vertical hydraulic shear near the center of the shop for general purposes. All furnaces are of oil burning type, supplied from tanks located in a concrete oil house about 200 ft. south of the forge shop, under a pressure of 20 lbs. All forges are fitted with 22-ft. stacks extending through the roof, thus removing the smoke and gases by means of natural draft.

STORE AND OFFICE BUILDING AND OIL HOUSE.

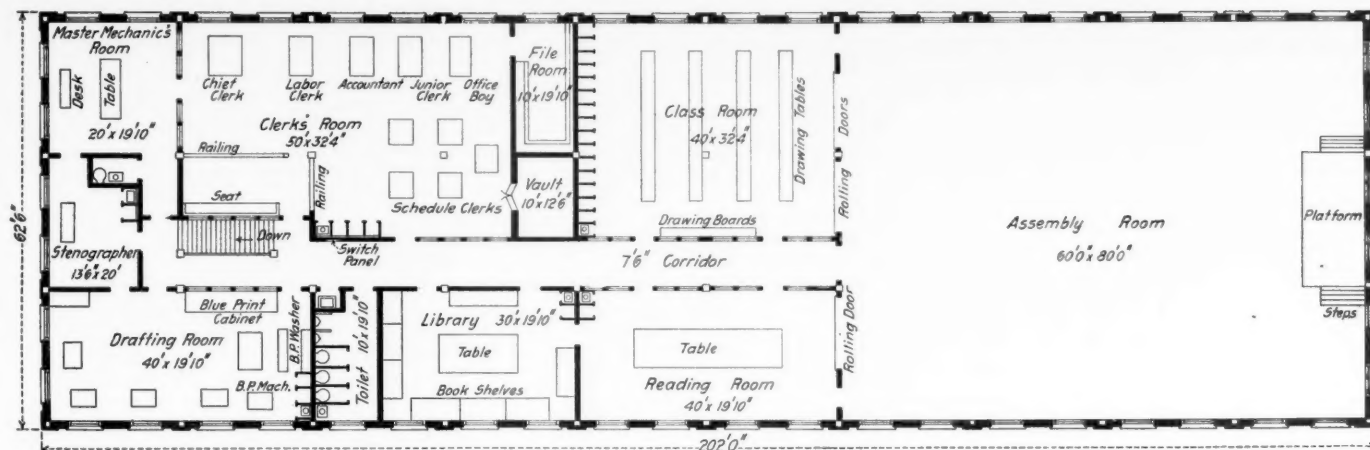
The store and office building is a two-story structure, built of reinforced concrete and brick. It is 60 ft. x 200 ft. On each of the two sides there is a concrete platform 12 ft. wide. This platform is on a level with the first floor, which is occupied by the stores department; and the unloading tracks, which run on either side of the building, are located at a level convenient for unloading freight from the cars to the platform. These platforms extend to the center of the mid-way, where heavy material may be easily handled with the yard crane. The platform along the east side extends to and around the oil house, which is located about 150 ft. from the store and office building. On entering the building one finds himself in a spacious hallway; to the right is the clerk's office

a week are devoted to the instructions of apprentices in Mechanical Drawing, Practical Mechanics and Electricity. Across the hall from the drawing class room is a reading room 20 ft. x 40 ft.; this room is provided with the latest periodicals. Leading from this room and also from the drawing class room are vertical rolling doors, which may be opened into the assembly room. The assembly room is 60 ft. x 80 ft., and will accommodate about 400 persons easily, making an ideal place for social functions, lectures, etc. Continuing along the east side and opening from the reading room is a well stocked library, and next to it the drafting room, 20 ft. x 40 ft.

The oil house is a single story building, 30 ft. x 40 ft., built of reinforced concrete and brick. The floor of the building is about 10 ft. above the ground level, which happens to be low at this point and makes a convenient place for the oil storage tanks, of which there are ten with a capacity of



The Assembly Room.



Plan of Second Floor; Store and Office Building.

of the stores department and to the left is the storekeeper's private office; while directly in front is a stairway leading to the motive power department offices which occupy the second floor. Back of the stairway on the first floor are located the vault, filing and toilet rooms; and then comes the general store room which is fitted up with the necessary shelving, counters, scales, etc., and is very complete in detail.

The second story is occupied by the master mechanic and his staff. It is divided into two sections by a hallway running from the top of the stairway to the assembly rooms at the north end. The master mechanic's private office, which is located at the southwest corner, is a commodious room, 20 ft. square, finished in quartered oak with maple floor and tinted walls. Next to this is the stenographer's office, 14 ft. x 20 ft., and further on the clerks' room, 32 ft. x 50 ft.; adjacent to the clerks' room are the filing room and vaults. Continuing along the west side, the drawing class room is next; this is 32 ft. x 40 ft. It is fitted with tables, drawing boards, blackboards, etc., and across one end is a row of clothes lockers for those who attend the evening classes. Two evenings

8,000 gal. each. The oil house is divided into two rooms of equal size. One is used as a pump room for pumping the oil from the tank below and the other for the storing of oil in barrels. There are six oil pumps, three of which are power pumps and the others operated by hand. They are of the self-measuring type, made by S. F. Bowser & Co., Inc., Fort Wayne, Ind. The power pumps are operated by a 2-h.p. Western Electric motors, belted to a line shaft.

SEWERAGE.

It was necessary to install two sewer systems, as it is against the rules of the city board of health to dump raw sewage into the creek at this point because it would become a nuisance in the summer when the water is low, as the creek flows through the center of the city for two miles. It was a case of either putting in a purification plant or pump 1,000 ft. against a head of 25 ft. into the city sewer. There is such a small difference in elevation between the end of the sewer and the creek which is close by, that filtration beds would be overflowed several times every year by the high water in the creek; therefore it was decided to install the

pumping plant. The pump pit house is located south of the buildings and all sewage is brought to this point by gravity. The pumping apparatus consists of two separate units so that one is always ready in case anything goes wrong with the other. Each has a centrifugal pump directly connected to a vertical motor which is controlled by a float switch, and when water reaches the required height in the pit one pump starts up and pumps it out, and if this pump does not work the other pump will start when the level gets a few inches higher. All rain water and water used for washing out engines, cooling compressors, etc., is carried into the storm sewer and into the creek by gravity. The sewers are built of extra heavy double strength sewer tile with self-cleaning grades outside of the buildings, and inside the buildings all sewers are of cast iron soil pipe to a point 4 in. outside the buildings.

TELEPHONE SYSTEM.

A local telephone system, connecting all foremen's offices, small stores, power house and other departments, has been installed. The switchboard is located in the general office of the master mechanic. At present 14 telephones are used and provision has been made on the switchboard for a total of 25, which will be installed when the foundry, frog shop, carpenter shop and car department are added to the present plant.

TIME REGISTRATION.

Each workman is required to punch a time clock on entering the shop in the morning, when leaving and returning at noon and when leaving in the evening. Eight-day time registering clocks are used for this purpose. They are distributed in such a manner that they are convenient for a workman to punch without extra walking from his entrance to the building.

MOTORS.

The a.c. motor is used in all cases except where speed variations cannot be mechanically accomplished, in which case d.c. motors are employed. All motors from 5 h.p. and over are equipped with suitable starting devices, fuses and circuit breakers with low voltage release.

LIGHTING.

The general shop lighting is by Cooper-Hewitt Co.'s (New York) a.c. mercury lamps which give a very steady and efficient light. They use a set of balanced coils, star connected to the 440 volt shop feeders. This gives a voltage between the neutral wire and any phase of 255 volts, which operates them. They are self-starting and light up as soon as the switch is turned without tilting the tubes. They are connected two in multiple for each switch. The installation here is interesting because this is about the first large shop in the country to install the a.c. type of Cooper-Hewitt lamp. The incandescent lights for drop lights in the engine pit, erecting bay and foremen's offices are tapped directly off the 250-volt d.c. feeders. The lights for offices and store houses are incandescent and use transformers to step down to 440-volt a.c. to 100 volts. The yard lighting uses series arc lights. A special panel and constant current transformer is located in the power house for these, as the switchboard attendant turns them off and on.

COMPRESSED AIR.

The compressed air system is rather a novel departure from the usual practice, as a number of units distributed over the shops are used instead of a centrally located one. There are three 100-h.p. Ingersoll-Rand Co.'s (New York) air compressors, directly connected to 106 h.p. Western Electric inducing motors having Cutler Hammer magnetic starters that automatically maintain an air pressure of 100 lbs. One is located in the north end of the machine shop, one in the center and the other in the boiler shop; two of them can supply the maximum demand, one being available in case of emergency. These receive air from the outside. The air piping is carried overhead on the roof trusses and pipes to drops are carried down the column, piping for its pits being hung in the heating tunnel which extends along the end of the pits.

In all negotiations in regard to the new shops the railway company was represented by E. H. Fitzhugh, third vice-president of the Grand Trunk Railway System. He was assisted

in his conferences with regard to the details of the work by W. D. Robb, superintendent of motive power, and by J. T. McGrath, master mechanic, who is now in charge of the operation of the shops. The contract for the concrete foundations and for the building superstructure was let to Henry L. Vander Horst, Kalamazoo, Mich. The contract for the steel work and its erection was let to the American Bridge Company, New York. The complete piping systems for air, steam, water and oil have been installed by John R. Kehm Company, of Chicago; while the Western Electric Company, through its New York office, had the contract for furnishing and installing all power and light wiring. The Arnold Company, Chicago, engineers and constructors, served the railway company in the capacity of designers and supervisors of the complete shop plant, including buildings and equipment, with the exception of the machine tool layout, which was handled by the railway company.

RAIL FAILURES ON THE ROCK ISLAND LINES.

Rail failures on the Rock Island lines for the six months ending October 31, 1908, are shown in the accompanying tables. This period is the first of the six-month periods covered by the reports on rail failures made by the railways to the American Railway Association; reports are also to be made regularly each six months thereafter. We are indebted to J. B. Berry, Chief Engineer of the Rock Island, for this data. He says that "when the trackmen become thoroughly familiar with requirements of the failed rail reports it is hoped that future series of diagrams will give more information than the present set."

Table I. shows total rail failures by months for the various sections. The 80-lb. re-rolled section weighs slightly over 73 lbs. per yard, being reduced from 80-lb. A. S. C. E. section.

TABLE I.

	Total failures				Total failures			
	80-lb.*	80-lb.	85-lb.	100-lb.	80-lb.*	80-lb.	85-lb.	100-lb.
May	9	1	1	1	0.38	0.19	0.19	22.22
June	18	5	2	1	0.76	0.95	44.44	
July	1	7	...	...	0.80	0.29	...	...
August	2	8	...	1	1.59	0.34	...	22.22
September	10	4	5	...	0.42	0.76	111.12	
October	17	4	...	...	0.71	0.76	...	...
Total	3	69	14	9	2.39	2.90	2.66	200.00
Track, miles..	125.8	2,378.1	526.8	4.5	...	...	...	...

NOTE.—The track mileage is for each section.

*Re-rolled.

While the mileage of the 100-lb. section is small, the rate of failures per 100 track miles is exceedingly large.

Table II. shows the life of failed rails. The noticeable feature is the extremely high rate of failure of the 100-lb. rail; also the high rate of failure of the 85-lb. section as compared with the 80-lb. section with life of three years or less.

TABLE II.

Life.	Failures per 100 miles of track—			
	80-lb.	80-lb.	85-lb.	100-lb.
1 year or less	rerolled.	80-lb.	85-lb.	100-lb.
From 1 to 2 years	3.80	...	0.95	200.0
" 2 " 3 "	0.13	3.98	...
" 3 " 4 "	0.17	...	...
" 4 " 5 "	0.85	...	...
" 5 " 6 "	0.25	...	...
" 6 " 7 "	0.59	...	...
" 7 " 8 "	0.85	...	...
" 8 " 9 "	0.81	...	...
" 9 " 10 "	0.77	...	...
Over 10 years	3.44	...	...

NOTE.—No. 80-lb. rerolled rail laid prior to 1906. No 80-lb. rail laid since 1905. No 85-lb. rail laid prior to 1905. No 100-lb. rail laid prior to 1907.

Table III. shows the several kinds of failures per 100 miles of track:

TABLE III.

Kind of failure.	Failures per 100 miles of track—			
	80-lb.	80-lb.	85-lb.	100-lb.
Broken rail	rerolled.	80-lb.	85-lb.	100-lb.
Split end or head	2.39	1.64	0.95	...
Mashed head .....	...	0.46	1.14	160.0
Battered end or top .....	...	0.04	0.57	40.0
Crack in web or through bolt holes .....	...	0.29	...	...
Broken base .....	...	0.34	...	...
Broken base .....	...	0.13	...	...
Total	2.39	2.90	2.66	200.0

Broken rails cover nearly 57 per cent. of the failures of the

80-lb. rail, 39 per cent. being breaks in or at patented joints, and 6 per cent. in other joints; the remaining 12 per cent. are intermediate breakages. Nearly 36 per cent. of the 85-lb. failures were broken rails, 11 per cent. being at patented joints, and 25 per cent. intermediate breakages. Studies are to be made of these breakages in patented joints to see if they are due to the type of the joint.

The 100-lb. rail failures are all head failures and are extremely high, due mostly to soft steel. The head failures of 85-lb. rail are much higher than for the 80-lb. section.

Table IV. shows the rate of failures segregated according to manufacturers. The failures of the 80-lb. and 85-lb. sections rolled by the Illinois Steel Company have the lowest rate, but with the 100-lb. rail, which was all from this company, the failures are excessive.

TABLE IV.

	80-lb.			85-lb.			100-lb.		
	Miles of track.	Failures Tot'l. mls.	Pr 100	Miles of track.	Failures Tot'l. mls.	Pr 100	Miles of track.	Failures Tot'l. mls.	Pr 100
Penn St'l Co.	31.3	4	12.8	.....	.....	.....	.....	.....	.....
Nat'l St'l Co.	43.0	2	4.7	.....	.....	.....	.....	.....	.....
T. C. & I. Co.	0.79	2	.....	.....	.....	.....	.....	.....	.....
Ill. Steel Co.	2,199.0	52	2.4	515.9	13	2.5	4.5	9	.....
Md. St'l Co.	104.1	9	8.6	.....	.....	.....	.....	.....	.....
Lorain St'l Co.	.....	.....	.....	10.9	1	9.2	.....	.....	.....
American McK. process rerolled 80-lb.—125.8 miles of track, 3 failures; 2.39 failures per 100 miles.									

The rate of failure of the 80-lb. rail from the Tennessee Coal & Iron Co. is exceedingly high. This was open-hearth steel, only a small quantity being laid, and the two failures were due to defects in the head. This rail is showing splendid wearing qualities, being laid on curve and showing less than one-half the wear of Bessemer rail which was laid adjacent to it at the same time.

PUBLIC REGULATION AND CONTROL OF RAILWAYS.*

BY FREDERIC A. DELANO,
President, Wabash Railroad.

What I am most interested in discussing this evening and pointing out to you is the immense demands on the railways and the conditions which must exist before these demands can be met. Bear in mind, please, that in any case railways will be built and developed only by the capital of our people or of such foreigners as may be induced to invest in this country. This is just as true, whether the railways belong to the government, or whether they belong to and are operated by individuals. The only difference is that in the case of government ownership the government raises the money for the purchase or building of the railways by a guarantee of the bonds and stock; whereas under private ownership the investor buys from the railway company direct, and on its credit only. (A large portion of the investment in railways is indirectly from the masses of people whose funds in the hands of banks and insurance companies are invested in railway securities.) Regardless, therefore, whether the ownership of the railways is public or private, it is evident that public necessity exists for a constant and annual expansion; that this necessity requires an expenditure of something like \$650,000,000 per year on the average; that this sum of money can only be raised from surplus earnings, or by borrowing. If, by borrowing, that borrowing must be on the credit of the borrower.†

In the face of this condition of affairs, it is not strange that railway officials feel a good deal of annoyance and are disposed to be irritated at the disposition of the legislatures, first to reduce their sources of revenue; second, to increase their expenses; third, to demand public improvements. For,

*An address before the Hannibal Commercial Club, Hannibal, Mo., March 25, 1909.

†It is often said of borrowing that any one can borrow, but the terms at which one may borrow depend wholly on the credit of the borrower. During the last two years there are a good many cases on record where great railway companies have paid as high as 9 and 10 per cent. for the use of money, thus indicating very well their dire needs, as well as the extent to which their ability to pay their debts has been jeopardized.

bearing in mind, that railway men claim to be no better than the rest of humanity, they do claim to be human, and subject to the same desires and ambitions as the rest of the family. Indeed, I may say that in all my railway experience, I have never met a railway officer who did not want to spend money on his road as fast as the credit of his company, the ingenuity of his bankers, and the approval of his directors would permit. This is only reasonable and human. The manager of a single track road wants to make it a double track line; he wants to get rid of many bad grade crossings; he wants to adopt safety appliances; he wants to reduce his grades and curvature in order that he may show more efficient operation. Is it to be wondered at that he feels irritated and even peevish when the state legislature reduces passenger fares, or freight rates, to a point at which the operation of the road becomes unprofitable? Is it to be wondered at that he is irritated when the state limits the length of trains; limits his methods of operation; requires him to employ three brakemen when he thinks two are sufficient? Is it to be wondered at, when, on top of all these restrictions and requirements, sundry betterments and improvements are demanded; and finally, when politicians ride into office or win political preferment by their abuse of railway management and methods, that the patience of the railway man is well-nigh exhausted?

What is the remedy for these conditions? Evidently the remedy which the railways need more than any other is a rest from the attacks made upon them. Railway operation and management is complex and involves so many problems and commercial questions that what the railways need is more thorough study of the questions and less disposition on the part of all communities to jump at conclusions. Mr. Willard, Second Vice-President of the Burlington Company, covers the point well in a recent address made to a body of the employees of that company at Galesburg. He says:

"In my opinion, railway business, which really means all business, will recover its former proportions when the influences and forces at work during the last two or three years shall have ceased doing the things that have contributed so largely towards bringing about the depression which we all deplore. Perhaps that it not quite clear. I do not mean that laws already made must necessarily be unmade, that wages raised must be reduced, but we must have a rest. We must be given time and opportunity to work out the new problems that have been forced upon us during the last two years. We must be given a chance to find out what it is going to cost to meet the new requirements, and also how much our revenues are going to be reduced by reduction of rates. Perhaps it will be found that by new methods growing out of the exigencies of the case we will still be able to earn a surplus sufficient to justify the resumption of extraordinary expenditures as formerly. If not, then, either rates must be advanced or wages reduced, or improvements must wait or be carried on with borrowed money, and railways will be slow to increase their interest-bearing debt under such circumstances."

In dealing with questions of this kind there have always been two broadly different policies, one the policy of great freedom from restraint, the other of extreme repression. The pendulum of public opinion swings slowly from one extreme to the other. The first policy is not often heard of now; it is usually called by the French name, *laissez faire*, i.e., "Let things alone." This policy was first developed by the economists in reaction from the excess of regulation and interference with business which reached its extreme development in France during the reign of Louis the Fourteenth and under the primacy of Colbert.*

While this "Let things alone" policy is no longer popular, it might be well to point out the logic of it when applied to present day conditions in respect to railways. The theory of the policy is that objectionable economic conditions have within themselves the elements of their own cure. In other words, that if things are left alone, natural causes will produce a remedy. Thus, if railways are built and prove very profit-

*Colbert, in the years 1661-72 developed the industries of France in a most astonishing way. Later, under a system of well-meant paternalism all sorts of governmental offices and commissions were created to regulate these industries and protect the public; but soon this system of over-regulation reached a point where it broke down of its own weight, and a sharp reaction to the *laissez faire* doctrine took place.

able, other railways will be built in competition, and competition will soon divide and diminish profits. If, on the other hand, railway building proves to be unprofitable, if state interference and hostile legislation tend to diminish profits below a reasonable point, railway building and development will cease.

Whether there is anything in this doctrine or not, it is, as I have already said, an unpopular one to-day, for the reason that communities are much too impatient to get results. People who believe in temperance are unwilling to wait for the slow process of education and the spread of morality to produce the desired results, but insist that temperate habits must be brought about by a law which will compel total abstinence.

In the same way, if the community thinks the rates they are charged are too high, they don't investigate the matter, but they straightaway get legislation compelling the roads to reduce rates, apparently entirely overlooking the economic results which will certainly flow from such a course.

In an undertaking where a large portion of the capital invested is in a fixed form—structures, buildings, etc.—capital once invested cannot be easily withdrawn. This is more true of railway investment than of any other form of endeavor, and so the public are inclined to jump at the conclusion that because capital has been invested in railways, and the railways cannot be taken away, and trains must be operated, they can with impunity "put on the screws." Without commenting on the morality of such a point of view it should be borne in mind that the railway is not a completed thing; that even some of our most perfect trunk lines are constantly undergoing change. Thus, one of the country's greatest railways is said to have been relocated in some stretches of its line, four different times, in order to get better gradients or alignment; for, after all, the final economic location of a railway is subject to change until it reaches perfection—the only perfect railway being the railway which is both level and straight. The amount which can be economically spent on a railway and still produce return on the expenditure depends, first, on the rate of interest paid for the money, and, secondly, on the volume of the traffic involved. A very trifling saving per ton of freight or per passenger handled, spread over a sufficient volume of business, will warrant the expenditure of very large amounts.

These instances are cited simply to show that a constant supply of money is needed for the improvement and development of existing railways, to say nothing of making extensions or building railways into new country. There is not a railway man who could not cite from his own experience dozens of instances where the expenditure of hundreds of thousands, and even millions of dollars would, in his opinion, be justified by reason of the economies produced, and yet, in such times as these, it is with most railways impossible to raise money. If this is true of improvements and betterments which increase the earning capacity, or reduce the cost of doing business to an extent sufficient to fully warrant them, how much more is it true of those forms of expenditures in which the public is vitally interested; for example, a better and safer track; better and more commodious stations; better and faster trains; better car equipment; the abolition of grade crossings, and many other things which I might mention that are necessary or very desirable, but do not produce an additional revenue.

The reverse of the policy which permits things to work out their own salvation is the policy of regulation which is so much in vogue to-day. Its theory is that all functions in which the public are generally interested must be either owned or subject to control by the state; that is, the community at large. I shall certainly not take the position that this is either an unfair or unworkable theory; but I shall endeavor to point out some of the difficulties which have arisen under its operation.

To begin with, it is only human nature that a man or group of men who put their money into an enterprise should desire the full control of it. In ordinary manufacturing or commercial undertakings every man has his own notions about the conduct of his business, and does not want to be interfered with, or dictated to by people who know less about his business than he does himself. Now, while it may be argued in the case of public service corporations that the people who have put their money into these enterprises, have done it with their eyes open and with full knowledge that they were subject to governmental regulation and control, there is nothing in that argument which makes public interference any more palatable to the man or group of men who are interfered with. The fact that the ordinary merchant does not like to be dictated to cannot be altered, even if you convince him that the law compels him to submit to that dictation. If the conduct of railways involves as many intricate and complex questions as the conduct of other business, then you will have to admit from the analogy of your own experience, that interference and dictation especially when it comes from those less familiar, less acquainted with the problems, is, to say the least, difficult to bear and very annoying.

There is a movement on foot in some of our states for legislatures to delegate their authority in the supervision and conduct of public service corporations to specially created commissions. Theoretically, at least, this appears to be a movement in the right direction; that is, it shifts the control from a body so large that it is difficult to clearly establish responsibility, to a small body on which responsibility can be fixed and of which a fair degree of expert knowledge can be expected. On the other hand, the plan is still experimental and is by no means a proved success. It is opposed to the basic principles of democracy which, as I understand it, maintain that the average common sense of a large body will produce better results in the long run than the special knowledge of a small body of men. It sometimes happens that even a well selected commission is not given a fair chance—the unreasonable is expected of it. Public opinion sometimes forces action when it should permit deliberation and careful study. It is unfair to expect a group of three, five or seven men, who have not been trained to transportation problems, to grasp, within a few months, subjects which are considered intricate by men especially trained by long experience. And yet, that is what many of our states demand.*

That dealing with these problems requires special knowledge and training can hardly be contradicted by any one when one reflects on the intricacies of other business. Is there a single vocation in life which is not more complex to-day than that same vocation was twenty-five or fifty years ago? Is there a single vocation, profession, commercial or manufacturing undertaking which does not demand a greater training and a greater degree of specializing to-day than it demanded twenty-five or fifty years ago? I feel that I may safely say there is not, and, further, that the railway is no exception to the general rule.

A year or more ago when the railways were smarting severely under the heavy depression in business, and concerted efforts were under consideration to advance rates of freight as preferable to any scheme of reducing wages, the railway officers of the country, in spite of their own convictions as to the justification for an advance, concluded to go slow and not make advances. Repeatedly, I have been asked by prominent manufacturers of railway supplies, "Why don't you advance your rates? This is the only way you can improve your credit, increase your purchasing power, and enable you to again come into the market and buy our goods." My answer has been, just as that of many others, that it was not feasible to advance

*In the case of the Interstate Commerce Commission we have a notable example. Here is a group of men who are required to exercise inquisitorial, administrative and judicial functions. We might as reasonably expect a court to act as prosecuting attorney, listen to the evidence, decide the case, and administer the law.

rates generally until the community at large was convinced of the justice of the proposition. Not until some headway was made against the hostility, which, rightly or wrongly, exists against the railways, can we get an advance in our rates which will be remunerative and which will again restore the purchasing power of the railways.

You may argue, as many have argued, that this panic started in Wall Street, and that it existed nowhere else—and, indeed, it is fortunate for the country that our immense agricultural sections have felt the panic and recession so very little—but if you do not know what the panic has been, I will advise you to go into the manufacturing sections of the country, to any of our large cities or the centers of the iron, coal, and coke industry. It is true that these industries have been talking brave just as many railways have been talking brave. In fact, it often happens that the officers of a railway corporation are in the same sort of position as the officers of a bank, when they fear a run on the bank. It won't do to admit to the public that your credit is weak, that you are well-nigh insolvent, that you are not earning the interest on your debts. You may at that very minute be trying to borrow money to tide you over the bad period. So it happens that the railway man must do the same thing that the banker or the manufacturer or the merchant does when he is put in a similar position. He puts a brave face on the situation. He makes light of his troubles. He urges that things are not so bad as they might be. He expects an improvement shortly, and says in fact all that he needs is a little temporary assistance.

Happily, that critical period is past, and we can now look at some of these questions squarely, and without any dissimulation. Many people who are despondent over the situation will tell you that there is a general spread of socialistic ideas, and that it is this which is causing the trouble. Personally, I am not alarmed on this score, because I have the utmost faith in the sound common sense of the American people; and while I realize that a little education is often a dangerous thing, and leads men to very ill-judged and mischievous conclusions, I feel sure that the public becomes more familiar with these difficult problems, they will become more and more conservative and cautious. Socialism is a dreaded word with many people; but, after all, it is a word which is so difficult to define, that scarcely two people understand the same thing by it. To some men it is synonymous with anarchy; to others it means state ownership, to others again, communism; some men picture it as a kind of Utopia, the ideal of all unselfishness, but admittedly well-nigh incompatible with human nature as it exists about us. These isms do not discourage me, because I believe that human nature, while much the same the world over, is gradually changing for the better; that our general education and our freedom of discussion are helping all the time to bring about a better understanding and a better condition of affairs.

Along these lines of discussion of these questions, government ownership is sometimes suggested. Personally, I would oppose government ownership, not for the effect it would have on the railways, but on account of the results to the government and the community. I have no fear that government ownership will be brought about from below, but I have much greater dread that it may be brought about from above. In other words, there is much less danger that the general public will demand government ownership of railways and the taking over of railway property by the federal government, than there is that the representative and large owners of railway property will become so tired of petty annoyances, interference, control of profits, etc., that they will be the ones to seek to bring it about. But there is no immediate danger of this; it will not come within your lifetime or mine.

In this connection, one thing often lost sight of is that when the government undertakes control of any large public function, there is no supervision or control over that operation. The government can not successfully supervise itself. Theoretically,

the supervision is in the whole people, but the difficulty then is that "what is everybody's business is nobody's business." On the other hand, under private ownership of public utilities, there can be public supervision, criticism, and finally control, a degree of control which is practically not possible in the case of any governmental department.*

From the standpoint of the public, then, it seems to me that private ownership and public supervision and control is the ideal method unless it is pushed to an extreme where it necessarily breaks down. In other words, it can be pushed to the extreme where there is no incentive or inducement for private capital to enter; where even though the capital already invested may not be withdrawn, no new capital will come in; expansion and development ceases. We are nearer this condition of affairs in this country than the railway men care to admit; but actions speak louder than words, and you can see the results of diminished capital investment in railway enterprises, in the diminished purchasing of material and the cessation of improvements and betterments. The railway men of the country would like to see an end to this condition of affairs, but I for one say it would be better that the lesson so dearly bought should be learned and comprehended by all. I doubt very much if the country as a whole can be prosperous with the greatest single industry on starvation rations. There never was a time when there was a greater need for thorough study—courageous, patient, good-tempered study of such great public questions. Better the *laissez faire* policy than the "pin pricking" policy, the thoughtless tinkering with legislation, of which we have all seen so much.

As has been said already, the worst of this storm has passed, and even though conditions are still depressed, it is better that the railways should be patient than that they should adopt harsh or retaliatory tactics. For this, if for no other reason, it would be better that railways should continue to live on a starvation basis and from hand to mouth, than that any summary action, however justified it may be, should be taken. The railways of the country are suffering—and suffering sorely, there is no doubt about it; but they can afford to suffer if by so doing the community as a whole is learning the lesson which should be learned by such an experience. As a nation, we have had a sharp spell of sickness, and it would be dangerous for us to assume that because we feel better we have entirely recovered our strength. Let us thoroughly understand the cause of the malady, and after the disease has run its course we will be ourselves again, immune, I hope forever, from this particular complaint.

The great state of Missouri—one of the greatest in the Union in area and natural resources—is surely not ready to say that it invites no more capital for investment in railway improvements, expansion and extension; and even if not a single mile of railway were needed in this state to develop unoccupied areas, there is scarcely a mile of existing trackage in which some sort of betterment or improvement is not desired. How shall the capital to make these improvements be obtained? Certainly in one way, and one way only; that is, by making the enterprise reasonably profitable. And you will pardon me for suggesting it, for I cannot help thinking it is the wise course, that a public service commission, instead of busying itself solely in defining the duties which this road or that should perform and the improvements which should be made, might very properly study the sources of revenue of the railways, ascertain why it was that the roads were not

*It is to be remarked in this connection that in no municipal, state or federal operation in this country have we the degree of publicity in reports of revenue, cost of service or profits that are commonly given voluntarily by corporations to their stockholders, or the public. Also that in private undertakings there is necessarily a relation between income and out-go; whereas in our country in all public finances, we have as yet created nothing effective in this direction. We go merrily on spending money without knowing where the revenue is coming from, and when we get "hard up" we sell bonds or increase taxes. This period of adolescent finance cannot continue indefinitely, but in the meantime our people are failing to learn the most important lesson of political economy—a condition which, unless the lesson is learned, must sooner or later get us into serious trouble.

more profitable, co-operate with the management in effecting economies or increasing earnings, with the certainty that every dollar profitably invested in the railways will attract additional dollars to the state. I have not heard of any state commission that has gone about its work in this way, and perhaps public opinion has not arrived at the point where a commission so minded would have public support; but certainly a commission could safely assume this attitude, for it would be in a position to use its regulative power at any time in protection of public interests if it saw the railways gathering in excessive profits and failing to do their full duty to the public. My own experience in the study of railways of the country convinces me that even the richest railways are paying only moderate returns on the capital actually invested and are making large expenditures for betterments and improvements out of earnings.

Let me remind you that the capital invested in railways was invested with the hope of return—and while neither state nor federal government gave any guarantee of a return, neither did they place a limitation on it. Only in very recent years has any court suggested that the return should be limited. In other words, it now appears that while the bona fide investor here or abroad stood to lose all the money he put in (and cases are very numerous where he did lose all) he now finds the trend of recent decisions limiting the return to, say, 6 per cent. Remembering that the theory underlying the investment of capital is that the possible reward or return on the investment must increase about in proportion to the hazard incurred, does any one suppose that our railways, especially in the Far West, could have been built without any guarantee, if there had been an intimation that 6 per cent. was to be the limit of profit on the most successful operations? The answer to these questions I can safely leave to you, confident as I am of your fairness, and confident, too, that all we need is a more thorough knowledge of conditions and less disposition to cure every ill with a new law.

To prevent the accumulation of freight and baggage at stations, the French government has authorized the railways to remove all freight which is not taken away by the consignee himself within 48 hours of the time prescribed by the regulations, and to deliver it either at the address of the consignee or to a public warehouse. In the latter case, notice is to be given immediately to the consignee, and if his address is not known, to the shipper. When the baggage-room of a station is obstructed by an accumulation of baggage, the railway is authorized to deliver it itself to the residence, when given on the baggage, or to a public warehouse, and charge for such removal according to specified tariff. The permissible delay before removal is three days in Paris, five days at certain other stations specified by the Minister of Public Works, and eight days for all other stations.

HIGH SPEED HYDRAULIC FORGING PRESS.

This type of machine has practically replaced the steam hammer in Europe. It originated in the hydraulic forge press introduced for the manufacture of gun forgings, hammer plates and heavy general forgings. It was found that the heaviest steam hammers, notably the 125-ton hammer at South Bethlehem, Pa., and many large hammers in Europe, would work only on the surface of large ingots, overlapping if the blow was heavy, while the center of the ingot would stretch, making the grain large and accentuating imperfections. The

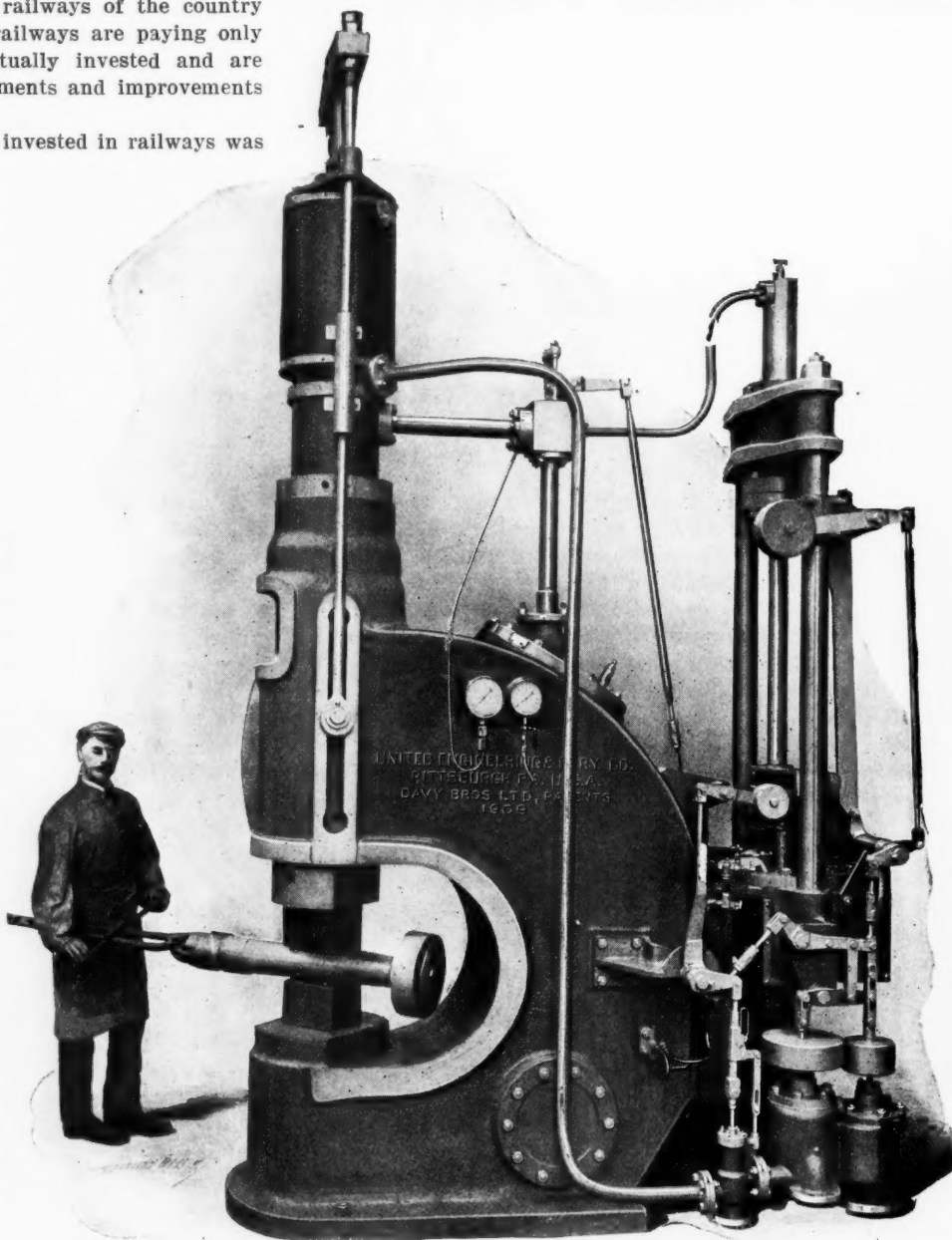


Fig. 1—Rapid Action Steam-Hydraulic Forging Press; Single Frame Type.

opposite result was obtained under the press, the sides and ends of the ingots bulging, showing that the metal was worked uniformly throughout the mass. The hydraulic press was found to be sufficiently rapid to manipulate and work the ingot for these large forgings, but the installation of high-pressure pumps, accumulations, pipe lines and valves was found to be expensive, both in first cost and maintenance and was not rapid enough for middle sized forgings. This led to the present type of high-speed steam hydraulic installations, which have been developed to a most efficient degree by Messrs. Davy Brothers, Ltd., Sheffield, England. The patents.

drawings and all information for America, Canada and Mexico have been acquired by the United Engineering & Foundry Co., Pittsburgh, Pa., which manufactures two types of these machines.

The single-frame type, shown in Fig. 1, is built in sizes from 150 to 400 tons capacity and the 4-column type, shown in Fig. 2, in sizes from 300 to 12,000 tons capacity. It is said that this type of machine has effectually supplanted the steam hammer, and so much so indeed, that but very few hammers of over 1,500 lbs. capacity have been installed in England, Germany, France or Austria within the past ten years, and that those previously operated are not now in use, having been replaced by the hydraulic press and the latter in their turn have

head is raised sufficiently to allow placing the forging between the dies. This operation forces the water from the press cylinder into the small intensifier cylinder until the plunger of the latter, and also its steam piston, is in its lowest position. Surplus water is then forced into the pre-filler, the check valve of which is opened by the first movement of the single lever. Should the cross head of the press be raised too high a forward motion of the single lever will exhaust the steam from the balance cylinders and permit the upper die to just clear or rest on the forging. The water from the pre-filler is under a light air pressure and simultaneously fills any space in the water system between the intensifier and the press cylinder. The machine is now ready to commence the work of pressing. The single lever is thrown forward of its center position, which places the balance cylinders under constant steam pressure, making a so-called "steam spring." Farther advance of the single lever opens the steam valve to the bottom of the steam intensifier cylinder. The piston ascends, forcing

the water from the small cylinder into the press cylinder, thus forcing the upper die down against the forging. A backward movement of the single lever exhausts the steam from the intensifier and the press head lifts sufficiently to clear the forging, a forward stroke again presses the forging, and so on. The position of the single lever determines the angularity of the flat bar shown on the right of the intensifier in Fig. 2, which is operated by the movable roller attached to the intensifier piston rod. This controls the steam cut-off or stroke of the intensifier; or, in other words, the press head follows the motion of the operator's hand, both as to speed and direction. It can be operated as fast as 120 strokes per min. for small machines and up to as high speeds on large presses as it is possible to manipulate the forging. It will be noted that the operation requires only the handling of valves under steam pressure, thus avoiding much of the trouble in hydraulic presses. The quick bend in the flat bar referred to serves to throw out the steam and opens the exhaust valve through floating levers without affecting the single lever. This prevents any overstroke of the piston in case of slip or accident to the forging. A notable illustration as to the merit of the process is the German Government specifications for steel forgings worked by rolls, hammer or press. Forgings made from rolled or hammered steel must have an initial section at least

eight times the finished section, while those made from pressed steel are required to be only four times the size of the finished section. It is claimed that the high-speed steam hydraulic presses will do double the work of the steam hammer with one-half the steam consumption. No especially massive foundations are used such as the steam hammer requires, and all noise, vibration and destruction to the machine is eliminated, thus making a large saving in the cost of maintenance. This type of high-speed steam hydraulic press, besides being used for all classes of forgings, is well adapted for die forging, flanging, pressing and shearing.

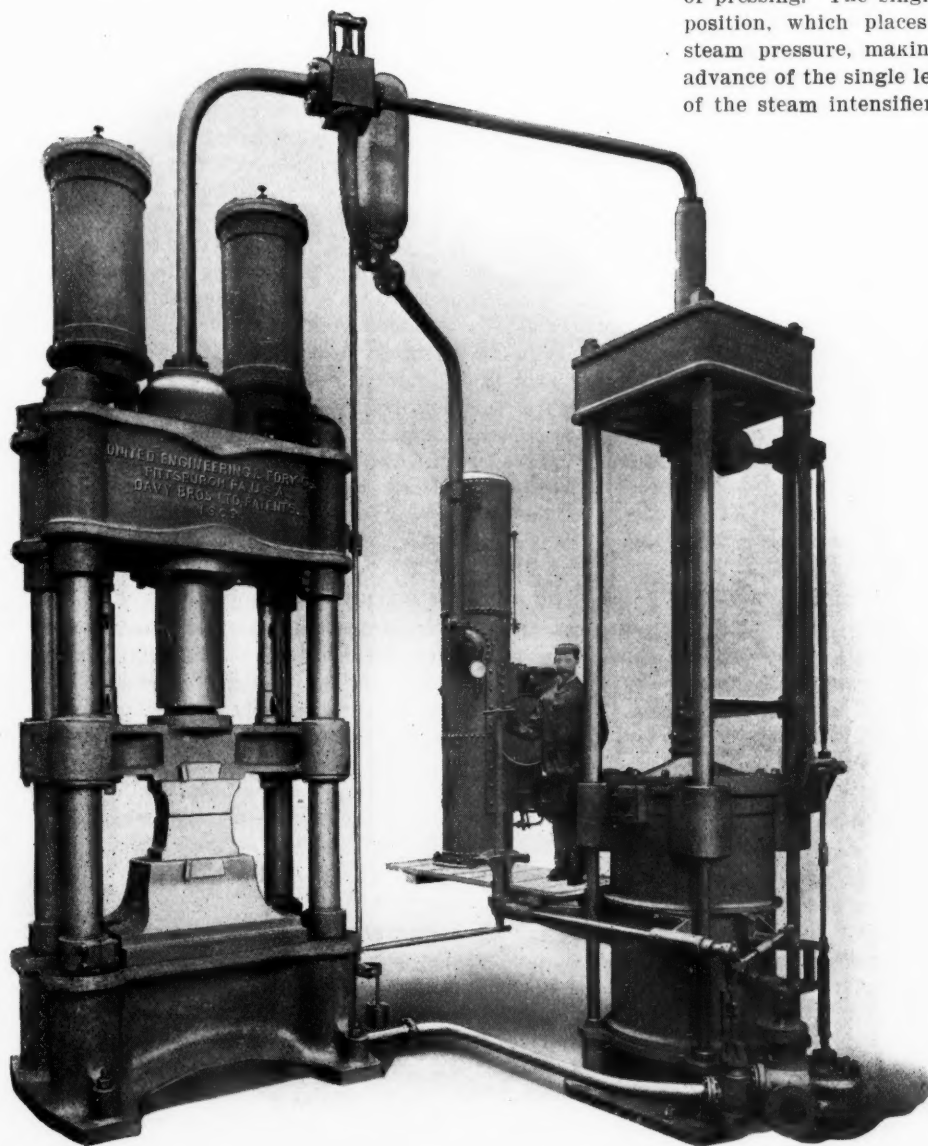


Fig. 2—Rapid Action Steam-Hydraulic Forging Press; Four Column Type, Single Cylinder.

been replaced by the high-speed steam hydraulic type.

The Davy high-speed type has a central plunger which is actuated by the water pressure from the steam hydraulic intensifier, located at the right of the press. The two steam balance cylinders are placed on the top of the entablature of the press, and the tank, seen in the center, contains air and water about 60 lbs. pressure. This tank is called the pre-filler. Beginning the operation with the forging dies together as shown in Fig. 2, the operator, by a movement of the single lever controlling gear, which is an important feature of this press, admits steam to the balance cylinders. The upper cross

NOTES ON THE ALTON SHOP, BLOOMINGTON.

The Chicago & Alton shops at Bloomington, Ill., are built of massive stone masonry with small windows and high pitched roof, the architecture being suggestive of feudal structures which were built for purposes of defense. In addition to the great expense of such construction it has the disadvantage of being poorly lighted; there is a vast space in the roof which adds to the cost of heating, and it fixes the location of the shops in a permanent way after the growth of the road makes other points more desirable. Even on so old a railway as the Baltimore & Ohio a rule was adopted several years ago which made the new structures at division points of rather a temporary character, as it was thought a few years might make desirable some changes in the operation of the road which would make terminal structures at some points unnecessary.

The early division points on the Northern Pacific were occupied by rather neat and substantial brick and stone shops, roundhouses and offices. As the grades were reduced and larger locomotives bought, the length of runs was extended and some of the division points were rendered obsolete and abandoned. The permanent character secured by brick walls did not prove of much value as fire protection, for when fire occurred the wood interior and oil-soaked floors burned rapidly and completely destroyed the contents.

The Wabash has adopted a cheap method of construction for shop walls which uses a light wooden framework covered with a curtain of wire netting and cement plaster, and much of the wall space is filled with glazed sash. This requires light foundations and is as effectual in fire protection as heavier brick walls. This construction answers well for car shops where heavy overhead cranes are not required. At the Dunmore shops of the Erie the erecting shop with traveling cranes has the longitudinal girders supported by steel columns in the usual way, and these rest on detached piers. The spaces between are filled by suspended curtains of cement covered expanded metal, and no foundations for side walls are required.

At Bloomington the Alton is commencing in a small way to get more light and floor space by tearing out some of the massive stone walls and extending the tool room. Since the combination of the Alton with the Clover Leaf, Bloomington is not the most central point for the principal shops of the system, and if the substantial buildings were not at that place it is probable the main shops would be located elsewhere.

The new Pacific consolidation and switch locomotives with the Pilliod valve gear have been delivered, and some of them are in service, doing excellent work. Improvements in the way of reducing the number of levers are now contemplated and have been worked out, and will probably be introduced in future construction. This gear has all the advantages of the Walschaerts gear in being located outside the frame, where it can be easily inspected and repaired. It has also some advantage over the Walschaerts in imparting a quicker movement of the valve at the time when such acceleration is desirable. In the matter of repairs the Pilliod gear should prove superior to any other in general use, as the wearing portions are all pins and bushings which are cheaply turned on a lathe and easily applied, the cost of labor and material being very small compared with that required for links, eccentrics and straps. The main thing with the Pilliod gear is to keep the pin bearings properly lubricated, and for this purpose the oil cups should be forged or cast solid with the levers, so they will not be easily lost or broken, as is apt to be the case with small brass oil cups. Previous Pacific engines of the same size have the Walschaerts gear, and there will be a good opportunity to measure the relative merits of these valve gears, not only in steam performance but in maintenance. The new road engines have 16-in. piston valves, which are probably the largest now in use on locomotives. The by-pass valves for drifting are the Pennsylvania type with a port and rectangular plate directly above the piston valve. The heavy

cylinder saddles are reinforced by two cross bolts $2\frac{1}{4}$ in. diameter with $2\frac{1}{2}$ -in. threads. The walls of the cylinders are $1\frac{3}{4}$ in. thick. The wrought-iron frames of the consolidation engines are 5 in. wide and over 37 in. long, without any splice. The frames for the Pacific engines are not spliced at the cylinder ends, where the principal difficulty is found with spliced frames. Some of the cast-steel frames on previous Pacific engines of this road have broken in as many as 12 places. The tenders of these engines have a capacity of 8,500 gals. of water and 14 tons of coal, but they are not as high as those previously built. The capacity is obtained by greater length, and the wheel base is increased, which is considered an advantage in preventing derailment. The engines have friction side bearings for both trucks, and the tender drawbars are made flexible in their attachments, so that they do not tend to produce derailment as rigid drawbars often do.

A new practice in fitting cylinder bushing is now being used at this shop. The bushing is turned on one-half of its length $\frac{1}{2}$ in. smaller in diameter than the other half, so that it is not necessary to press it into the cylinder for the whole length, but only half the length. Piston rods from engines in for general repairs are heated nearly red hot at each end in order to inspect for cracks, but this heating is not done in the forge, which often scores the surface of the fit. A small portable furnace is placed at a convenient point in the machine shop and on it lead is melted in a crucible. The piston rod end is immersed in the lead until it is well heated, and the expansion thus produced reveals any small cracks which might lead to complete fracture. Steel driving boxes are not slotted or otherwise finished for the bronze bearing fit. The bearing is cast into the box, which has a dam built around the face so that a hub liner is also cast solid with the journal bearing. The driving box is cored with dove-tail recesses, into which the bronze is cast, and this secures the bearing in position. The fit is also tapered longitudinally, so that the tendency is for any lateral pressure to make the bearing tighter.

The mudrings for large fireboxes are reinforced at the corners by welding on to the top a piece 1 in. thick, extending well around beyond the circular portion. A rectangular ring has little stiffness, and where there is a tendency to distortion the greatest stress is at the corners. Many mudrings are cut away at this point in order to provide space for the lap of the sheets, thus making them weaker, and a slight distortion causes them to leak. The reinforced corner is more rational and should prevent leakage of the rivets.

In the description of the American automatic stoker for locomotives (Strouse patents) in the *Railroad Age Gazette*, February 5, 1909, page 255, it was announced that this stoker had been ordered for 20 new engines for the Alton. These machine stokers are now being applied and one of them is in regular operation on a new consolidation engine in heavy freight service between Chicago and Bloomington. The engine, as fired by the automatic stoker, has handled on this run 60 loaded cars weighing 3,260 tons, which is 460 tons above the regular rating of this class of engines, the average speed being about 20 miles an hour. No hand firing is required over the whole run of 122 miles, and the regular working pressure of 200 lbs. is maintained much more uniformly than by hand firing. The result is the engine handles the train at a higher average speed. This is one of the principal advantages of an automatic stoker for locomotives. It does not get tired and there are no delays on account of low steam pressure, as is often the case when the fireman becomes exhausted toward the end of the run. It is evident that maximum tonnage haul can only be maintained over a whole division by a constant supply of steam at full working pressure, and when this fails the tonnage is cut down to suit the average conditions of pressure or the speed is reduced and the time over the division extended. The effect of the stoker on tonnage rating will thus be very favorable, and will result in shorter schedules with attendant economy in train operation.

General News Section.

The International & Great Northern has made with the American Refrigerator Car Co. a new contract under which refrigerator cars used by the road will be paid for by the day (at 60 cents) instead of by the mile.

A press despatch from Washington says that the Secretary of Agriculture has rejected the claim, which was presented by the New York Central, for about \$36,000, the amount expended by the company in disinfecting cattle cars and cattle yards on the order of the government last autumn.

The Chamber of Commerce of New York has appointed a committee of seven to study the Panama canal from the viewpoint of commerce. The committee consists of John R. Dunlap, Alfred P. Boller, C. A. Pugsley, William L. Landers, Jacob W. Millen, Jules F. Sorzano and John D. Crimmins.

A workman was recently blown from the Manhattan bridge, New York, by a break in a compressed air pipe line. He fell 110 ft. and was killed. A large pipe runs up the towers on each side, carrying air at high pressure for pneumatic tools. A coupling gave way and a jet of air struck the workman.

At Winnipeg, April 6, officers of the Canadian Pacific reached a revised agreement with the shop men who have been on strike or nursing grievances for several months past. The only feature of the agreement made public is that strikers returning to work will be restored to their original places as regards their pension privileges.

The State Railroad Commission of Indiana has issued to the mayors and common councils of cities within that state a circular showing the number of trespassers killed and injured on railway tracks in the state during the past year, and calling upon these municipal officers to take the most effective measures possible to stop the use of tracks as thoroughfares. The commission presents a draft of an ordinance which may be adopted by any city in Indiana, imposing a fine for walking on railway tracks.

The New York State Public Service Commission, First District, has appointed a hearing for April 20 on the question of ordering the Interborough Rapid Transit Co. to provide separate cars for women on the express trains running in the subway. Cars assigned exclusively for women are running in the Hudson & Manhattan tunnel and giving satisfaction. The officers of the Interborough say that they are willing to run separate cars for women, provided the commission will issue an order requiring it. The Interborough is putting middle side doors into eight cars, to be used on an experimental express train. Officers of the company believe that this arrangement will be more satisfactory than to have side doors near the ends of the cars.

Officers of the Illinois Central have submitted to the city a tentative estimate that the cost of electrifying its suburban tracks from Flossmoor to Randolph street, Chicago, would be between seven and eight million dollars. President Harahan said that the road's engineers were still studying the subject. When conclusions would be reached could not be foretold, but electrification of the tracks along the lake front probably would eventually be done. L. C. Fritch, Consulting Engineer, submitted to the city officials a tentative plan for the rearrangement of the road's tracks preliminary to electrification, which would be necessary before the suburban tracks alone could be electrified.

Transportation Exhibition at Buenos Ayres Next Year.

The year 1910 will be the centenary of the independence of the Argentine Republic, and it is proposed to celebrate the anniversary by an "International Exhibition of Railways and Land Transport," which will be held at Buenos Ayres from May to November of that year. The president of the executive

committee is Alberto Schneidewind, C.E., General Director of Argentine Railways, and the Secretary is Eduardo Schlatter, C.E. All industries embraced in the fields indicated by the title are invited to make exhibits, and a reasonable schedule of space-charges has been adopted. "No one is invited as a rival, for Argentine industries have not yet been fully developed, but a splendid market is open to all latest improvements and to all men of enterprise." The Argentine Republic has now 25,000 kilometers of railway lines and Buenos Ayres has 1,200,000 inhabitants. The 1,000 kilometers of electric tramways in the Republic might be multiplied tenfold within a short time. It is confidently believed that the influence of the exhibition will be felt throughout South America.

It is proposed to arrange the exhibits in 16 sections, as follows:

Section I., railways and tramways, moved by other than electric power; Section II., electric railways and electric tramways; Section III., automobiles; Section IV., bicycles; Section V., post offices, telegraph, telephone and other means of communication; Section VI., beasts of burden, horsemen and vehicles for teams; Section VII., ordinary public roads, bridle roads, highroads, suburban, street and sporting tracks; Section VIII., military transport and sanitary service in the transport of sick and wounded; Section IX., baggages, packing, etc.; Section X., municipal transports and vehicles, apparatus, etc., pertaining to the firewatch service; Section XI., decorative fine arts applied to the transport industry; Section XII., hygiene and sanitary assistance in land transports; Section XIII., providence, assistance and patronage in favor of workmen, employees of transport companies; Section XIV., galleries for the exhibition of national mechanical industries applied to transports, and gallery showing manufacturing in full action; Section XV., special national works; Section XVI., aeronautical experiments.

The executive committee consists of the following; all being railway officers or directors except Messrs. Pelleschi, Iturbe and Coloma:

Alberto Schneidewind, H. H. Loveday, J. A. Frias, Juan Pelleschi, J. A. Goudge, Emilio Lamarca, E. Schlatter, A. Iturbe, L. J. Dellepiani, Léon Girodias, Jose Pedriali, Manuel Moyano, Tomas Santa Coloma, Carlos Maschwitz, Alejandro Lértora, J. Percy Clarke and Fernando Guerriero.

Safety Measures in Indiana.

The Railroad Commissioners of Indiana, having been disappointed in their efforts to have certain laws passed by the recent legislature, have issued four letters to railway companies and city councils. The first letter urges city councils and town boards to enact ordinances to prevent the dumping of refuse on railway right-of-way; and the second asks action to break up the practice of trespassing on railways. The third letter, directed to superintendents of traction companies, asks for information as to what qualifications are required of employees, what method of examination is used, and what system is used to reward employees for faithful performance of duty. It is proposed to call a conference of the traction superintendents to assist the commission to prepare regulations. The fourth letter asks of steam roads the method of blocking switch frogs and rail intersections. The commission believes that the blocking now used by most of the roads is more dangerous than no blocks at all.

Memorial to W. H. Baldwin, Jr.

At Tuskegee, Ala., on April 4, there was unveiled a memorial tablet dedicated to the memory of William H. Baldwin, Jr., former President of the Long Island Railroad (1897-1905). The tablet is a portrait of Mr. Baldwin in marble, designed

by Karl Bitter, and it is supported on a brick monument made by the students of Tuskegee Institute, of which Mr. Baldwin was a trustee and a large benefactor. The inscription on the tablet reads: "A Man of Hearty Honesty and Goodwill, a Resolute Leader Toward Public Righteousness and Public Happiness." The monument is 16 ft. high and the tablet, of pink Tennessee marble, is 2 ft. wide and 6 ft. high. The portrait is carved in low relief. Beneath it is the figure of a negro youth holding in his extended hands palm branches. Other features combine to represent the triumphs of industry, the association of industry with literary work and the paying of the tribute to Mr. Baldwin, by the negro race, which has been so much benefited by his life and work.

Effect of Franchise Tax on the Long Island Railroad.

As an instance of the operation of the New York franchise tax law the experience of the Long Island Railroad is significant. In 1907 the lines of that company were assessed upon franchises to cross or occupy public streets upon the following valuations:

Long Island R. R. Co.	Borough of Brooklyn	\$100,000
Long Island R. R. Co.	Town of Smithtown	10,000
Ocean Electric Ry. Co.	Borough of Queens	90,000
N. Y., Bklyn & M. Beach Ry. Co.	Borough of Brooklyn	10,000
Nassau County Ry. Co.	Town of Oyster Bay	13,000
Glen Cove R. R. Co.	Town of Oyster Bay	25,000
Babylon R. R. Co.	Town of Babylon	8,000
Huntington R. R. Co.	Town of Huntington	22,200
Northport Traction Co.	Town of Huntington	11,000
Total		\$289,200

The taxes on these valuations, except that on the Long Island Railroad proper, were promptly paid; but in 1908 the assessments for practically the same property were fixed upon the following radically different basis:

Long Island R. R. Co.	Borough of Brooklyn	\$13,400
" " " "	Borough of Queens	1,121,300
" " " "	Town of Hempstead	12,000
" " " "	Town of North Hempstead	18,600
" " " "	Town of Oyster Bay	5,900
" " " "	Town of Babylon	11,500
" " " "	Town of Huntington	800
" " " "	Town of Brookhaven	3,700
" " " "	Town of Southampton	12,000
N. Y., Bklyn & M. Beach Ry. Co.	Borough of Brooklyn	396,700
N. Y., Bklyn & M. Beach Ry. Co.	Borough of Queens	33,300
N. Y. & Rockaway Beach Ry.	Borough of Queens	259,300
Nassau Elec. R.R. Co. (Atl. Ave)	Borough of Brooklyn	3,128,850
Montauk Water Company	Borough of Queens	5,270
Ocean Electric Ry. Co.	Borough of Queens	90,700
Jamaica & So. Shore R.R. Co.	Borough of Queens	1,000
Nassau County Ry. Co.	Town of Oyster Bay	13,000
Glen Cove R. R. Co.	Town of Oyster Bay	35,000
Babylon R. R. Co.	Town of Babylon	8,000
Huntington R. R. Co.	Town of Huntington	40,000
Northport Traction Co.	Town of Huntington	11,000
Total		\$5,221,320

A careful analysis of the amount of railway track crossing streets, or running within the limits of streets, for which the franchise tax was assessed, showed that the assessed valuation amounted to over \$800,000 per mile of track. Traction lines occupying longitudinally the full length of streets were assessed at about \$30,000 per mile, but steam railways which crossed public highways (the fee title to which in many instances was held by the railway company) either above or below grade, or at grade, were assessed in some cases upon a valuation of more than \$1,000,000 per mile of track.

Attention may also be called to the fact that under the new public service law of this state a corporation is prohibited from capitalizing any public franchises, and yet under the franchise tax law a very high value is placed upon such franchises as assets subject to state levy.

Prior to 1908 no assessment was made for a franchise of steam railways crossing a public highway existing previous to the time of its construction unless the highway was 200 ft. or more in width; but the legislature amended the law in 1907 and compelled the payment of franchise tax on every highway crossing which existed at the time the tracks were built, regardless of width; and, as a result, the total assessment against the Long Island Railroad for 1908 was over \$5,000,000. The Long Island Railroad has already paid its taxes in the few instances where the assessments were reasonable, and its management protests against the necessity which has been placed upon it of protecting itself through the intervention of the courts.

The valuations made for the year 1909 upon the property of the Long Island Railroad exceed those for the year 1908. The company feels obliged, in self protection, to resist the payment. No satisfaction, it is claimed, can be secured under the special law covering the matter to get the courts to pass upon it. The company has said to the state board that upon the assessment being placed upon some fair and reasonable valuation it was ready to pay its taxes immediately, but would not be subjected to extortion. In fact, the company has paid its franchise tax on several traction lines where a reasonable basis for valuation was made.

Although the company has not for years been able to pay a dividend to its stockholders, the total taxes paid by the Long Island system for 1908 amounted to more than 4 per cent. of the gross revenue of the company. With the increase in assessment, and the increase in the tax rate in Greater New York, its taxes for 1909 will amount to nearly 5 per cent. of the gross income, and if the special franchise tax is paid on the valuation made by the state board the total taxes will exceed 5½ per cent.

With such burdens placed upon it the officers of the company claim that the public can hardly expect the elimination of grade crossings, improved service or reduced rates of fare.

Signaling Schools on the Pennsylvania.

The Pennsylvania Railroad has established schools of signaling, one on each division. In 1902 there were on the lines east of Pittsburgh but 7,891 interlocking functions in operation, but in 1908 this number was 20,725—having just about tripled in a period of six years. These 20,725 functions are operated by 8,792 levers. A total of 12,408 signals are in service, on 3,385 miles of road, which is over 70 per cent. of the entire mileage. It represents a valuation of upwards of \$5,000,000. Among the first pupils of the schools will be six special signal apprentices who have recently been appointed: Messrs. J. C. Stoll, Geo. H. Wion, E. E. Schultz, C. S. Snavely, Allen B. Cooke and Harry B. Appleton. One of them will be on each of six divisions, the New York, the Philadelphia, the Pittsburgh, the West Jersey, the Middle and the Maryland divisions. Three of the appointees graduated from State College, Pa., and the others from Purdue, Illinois State and Ohio Normal School.

Apprentices will serve a three years' course. The first year will be spent on mechanical work, with the repair and construction gangs; the second year in the office of the supervisor of signals, and the third year on outside work on electric and electro-pneumatic appliances. They will report to the supervisor of signals while taking this course. The next place open to these men is the position of assistant signal inspector in the signal engineer's office. After attaining this, they will be considered in line of promotion to the following positions: Assistant supervisor of signals, supervisor of signals, inspector, assistant signal engineer and signal engineer.

Western Society of Engineers Favors an Illinois School of Mines.

The Western Society of Engineers, through its President, Andrews Allen, has appointed the following committee to draft a memorial for presentation to the Legislature of Illinois petitioning for the establishment of a Department of Mines at the State University: A. Bement, Chairman; F. A. Delano, Bion J. Arnold, John M. Ewen, Isham Randolph and Capt. R. W. Hunt.

The State University of Illinois is one of the most important schools in the country. It ranks fifth among American universities in attendance. It has long maintained Departments of Civil, Mechanical and Electrical Engineering and a Department of Agriculture, but, notwithstanding that Illinois is the second largest coal-producing state in the Union, the university has entirely neglected the subject of mining, with the result that this industry has suffered seriously, and that the loss of life and destruction of property in the operation of mines is increasing. For this reason the Western Society of Engineers believes that in the interests of the people of the state in general, as well as of those engaged in the mining business, there should be established a department of the university

that will tend to develop a higher degree of skill in the conduct of the mining industry.

A. Bement on April 7 read a paper before the Western Society of Engineers on the mineral resources of Illinois, in which he stated that 280,000,000 tons of coal has been wasted in the coal fields of that state. He said that according to the best recent calculations it would appear that Illinois contains more unmined coal than any other state. The known coal areas of Illinois contain 132,384,256,000 tons of coal, and there is an estimated additional quantity of 69,015,522,000 tons. Calculations show that about one-half of 1 per cent. of the total available supply in the state has been used, but the 25 per cent. of coal produced from the thin and medium thick seams is shipped away, and the state is practically dependent for its fuel supply on the product from thick seams which contained originally about 34,000,000,000 tons, of which 930,557,772 have been taken out. Thus the fuel supply suitable for use under present economic conditions is only 16 per cent. of the original amount, for while the coal remaining is about 99½ per cent., the really desirable portion is but 16 per cent.

Railway Business Association Before New York Legislature.

At Albany on Wednesday last a delegation of railway supply men, representing the Railway Business Association, appeared before the Senate Committee on Judiciary to protest against any amendment of the public utilities act. President Cutler, of the American Brake Shoe & Foundry Company, was chairman of the delegation and George A. Post, President of the Standard Coupler Company, and President of the Railway Business Association, made the principal address. The Public Service Commissions, he said, already have great power with which they have not yet had time to become familiar. "If," he added, "the Legislature will adjourn this year without having placed any new restrictions upon railways or indulging in any experimental or purely anticipatory legislation at their expense, there will be hope where there is now fear, and confidence where now is distrust. * * * It is a serious question whether in two short years, no matter how conscientiously he may study, any man, previously untutored in railway affairs, can, as a public service commissioner, become so profound a railway specialist that he is ripe for the bestowal on him of omnipotence in all railway matters. We do not discuss the details of the proposed enlargements of the powers of the commissioners. Whatever they are they cannot be of any such importance as would warrant their being piled upon the pyramid of their present powers. Any augmentation of the powers of the commissioners over railways at this time will surely add to the complexities of a situation now replete with undigested novelties in legislation and will surely tend to disquiet those to whom railways must look for money to carry on their plans of improvement and expansion."

Mr. Cutler said, in part: "President Taft has declared that we need to try out the laws we have before experimenting with others. The short session of the Sixtieth Congress adjourned without having enacted any important new restrictions upon railways. The Governor of Texas in one regular and two extra sessions has been unable to persuade the Legislature of that state that new restrictions should be imposed at this time. The Legislatures of Utah and Idaho have voted that the establishment of railway commissions might better be deferred until a time of greater industrial and commercial certainty, and Legislatures of other states have taken a conservative attitude as to railway legislation."

American Society of Mechanical Engineers.

At the spring meeting in Washington, D. C., May 4-7, professional sessions will be held at which papers on the conveying of materials, gas power engineering, steam turbines, the specific volume of saturated steam, oil well pumping and various other subjects will be discussed. The papers to be presented are as follows: A Unique Belt Conveyor, Ellis C. Soper; Automatic Feeders for Handling Material in Bulk, C. Kemble Baldwin; A New Transmission Dynamometer, Prof. Wm. H. Kenerson; Polishing Metals for Examination with the Microscope, A. Kingsbury; Marine Producer Gas Power, C. L.

Straub; Operating System for a Small Producer Gas Power Plant, C. W. Obert; A Method of Improving the Efficiency of Gas Engines, T. E. Butterfield; Offsetting Cylinders in Single-Acting Engines, Prof. T. M. Phetteplace; Small Steam Turbines, Geo. A. Orrok; Oil Well Tests, Edmund M. Ivens; Safety Valve Discussion; Specific Volume of Saturated Steam, Prof. C. H. Peabody; Some Properties of Steam, Prof. R. C. H. Heck; A New Departure in Flexible Staybolts, H. V. Wille.

Western Canada Railway Club.

At the meeting on April 12 a paper on "Reciprocal Demurrage" was read by H. R. Patriarche, Manager Canadian Car Service Bureau, Western Lines.

New York Railroad Club.

At the meeting on April 16, Walter V. Turner, M.E., Westinghouse Air Brake Co., Pittsburgh, Pa., will present a paper on "Development in Air Brakes for Railways, with a Brief Review of Past and Present Operating Conditions."

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.; May 11-14, 1909; Richmond, Va.
 AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Scranton, Pa.; May 11; St. Louis, Mo.
 AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.—R. W. Pope, 33 West 39th St., New York; second Friday in month; New York.
 AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 24 Park Place, New York, May 19, 1909; New York.
 AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—S. F. Patterson, B. & M., Concord, N. H.; Oct. 19, 1909; Jacksonville, Fla.
 AMERICAN RAILWAY ENGINEERING AND MAINT. OF WAY ASSOC.—E. H. Fritch, Monadnock Bldg., Chicago.
 AMERICAN RAILWAY INDUSTRIAL ASSOCIATION.—R. E. Wilson, Ry. Exchange, Chicago; May 11; Cincinnati, Ohio.
 AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony Bldg., Chicago; June 16-18, 1909; Atlantic City.
 AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St.; N. Y.; 1st and 3d Wed., except July and August; New York.
 AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., N. Y.; 2d Tues. in month; annual, Dec. 7-10; Montreal.
 AMERICAN STREET AND INTERURBAN RAILWAY ASSOCIATION.—B. V. Swenson, 29 W. 39th St., New York.
 ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago; April 28, 1909; Cincinnati.
 ASSOCIATION OF RAILWAY CLAIM AGENTS.—E. H. Hemus, A. T. & S. F., Topeka, Kan.; last week in May, 1909; Detroit, Mich.
 ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, Wisconsin Central Ry., Chicago; June 23-25, 1909; Detroit.
 ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 24 Park Pl., New York; June 22-23; Montreal.
 CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tues. in month, except June, July and Aug.; Montreal.
 CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, Montreal, Que.; irregular, usually weekly; Montreal.
 CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Friday in January, March, May, Sept. and Nov.; Buffalo.
 FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Rich. Fred. & Pot. R.R., Richmond, Va.; June 16, 1909; Old Point Comfort, Va.
 INTERNATIONAL MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., N. Y.; April 27-30, 1909; Louisville, Ky.
 INTERNATIONAL RAILWAY FUEL ASSOCIATION.—D. B. Sebastian, La Salle St. Station, Chicago; June 21-23, 1909; Chicago.
 INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—E. C. Cook, Royal Insurance Bldg., Chicago; June 1-5; Chicago.
 IOWA RAILWAY CLUB.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month, except July and August; Des Moines.
 MASTER CAR BUILDER'S ASSOCIATION.—J. W. Taylor, Old Colony Bldg., Chicago; June 21-23, 1909; Atlantic City.
 NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tues. in month, ex. June, July, Aug. and Sept.; Boston.
 NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August; New York.
 NORTH-WEST RAILWAY CLUB.—T. W. Flannagan, Soo Line, Minn.; 1st Tues. after 2d Mon., ex. June, July, Aug.; St. Paul and Minn.
 RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, Pittsburgh, Pa.; 4th Friday in month, except June, July and August; Pittsburgh.
 RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, 12 North Linden St., Bethlehem, Pa.; June 8; New York.
 RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C., Collinwood, Ohio; May 17-19; Chicago.
 ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.; Nov., 1909; Washington.
 ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug.; St. Louis.
 SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—J. H. O'Donnell, Bogalusa, La.
 SOUTHERN AND SOUTHWESTERN RY. CLUB.—A. J. Merrill, Prudential Bldg., Atlanta; 3d Thurs., Jan., April, Aug. and Nov.; Atlanta.
 TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R. R.R., East Buffalo, N. Y.; September, 1909; Denver.
 WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, 199 Chestnut St., Winnipeg; 2d Mon., ex. June, July and Aug.; Winnipeg.
 WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony Bldg., Chicago; 3d Tuesday each month, except June, July and August; Chicago.
 WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, Monadnock Bldg., Chicago; 1st Wednesday, except July and August; Chicago.

Traffic News.

The Lackawanna, the Grand Trunk and the New York, Ontario & Western have agreed to prorate with the Toledo & Western, an electric line, on through freight shipments.

The Central New York Car Demurrage Bureau reported 74,514 cars for March, 1909. The average day's detention by the railways was 0.39 and by the consignees 1.33, making a total average detention of 1.72 days.

The Grand Trunk Railway has established a department of industries to facilitate the introduction of new industries at points on its system and the development of those already existing. The head of the new department is W. P. Fitzsimmons, for many years associated with the road.

It is again reported that the Railway Commissioners of Mexico are about to undertake a general revision of the tariffs of all the Mexican roads; and it is stated that the decision to enter upon this work is due to the suggestion of S. M. Felton, President of the Mexican Central, formerly President of the Chicago & Alton.

The Gulf, Colorado & Santa Fe has announced the opening for freight traffic of its new deep water port at Bolivar, Tex., about five miles northeast from Galveston, across the bay. The port is prepared to receive vessels of any draft, and is being rapidly equipped for the prompt and economical handling of all commodities, export and import. The lumber region of eastern Texas will now have direct connection with tidewater. The harbor and port improvements have been made largely at the expense of the Atchison, Topeka & Santa Fe.

Representatives of leading coal companies have applied to the United States District Court at Huntington, W. Va., for an injunction restraining the Kanawha & Michigan, the Ohio Central Lines, the Chesapeake & Ohio and the Norfolk & Western from putting into effect a proposed new freight rate on coal to the lakes. It is charged that the West Virginia railways have been coerced by Pennsylvania Railroad interests into raising rates in the interest of Ohio and Pennsylvania operators, and that the proposed increase in rates will absolutely shut out West Virginia coal from lake markets.

The Union Pacific and its western connections have asked the Interstate Commerce Commission to relieve them from the operation of its order in the Spokane rate case. The distance from St. Paul and Chicago to Spokane by the Union Pacific and the Oregon Railroad & Navigation Company is substantially 50 per cent. and 25 per cent. greater, respectively, than over the Northern Pacific or the Great Northern. Consequently, officers of the Harriman Lines argue, it is manifestly unfair to apply, over their longer lines, the rates which the commission has held to be reasonable rates for the shorter distance over the direct lines.

Representatives of various organizations of shippers in Texas, Oklahoma and Kansas met in Oklahoma City, Okla., on April 5 and organized the Southwestern Shippers' Association, the purpose being to get the advantage of water rates from Galveston. At present in this region rates are based mainly on the all-rail rate from the East. After officers of the new association had been elected, J. L. Powell, of Wichita, Kan., being chosen President, the Executive Committee decided to prepare a full table of rates which will be submitted to the railways for application from Galveston to Texas, Oklahoma and Kansas points, and the roads will be asked to equalize the rail rates from the eastern seaboard with the water and rail rates via Galveston.

The Southwestern Shippers' Traffic Association has adopted resolutions urging Congress to pass an act to give the Interstate Commerce Commission control of the transportation rates of coastwise steamships. The resolutions state that the monopoly of the coastwise traffic given by the laws of the United States to steamships of American registry has restricted competition between water carriers, and that this restriction of competition has made it possible for the rail carriers, through ownership of some steamship lines and threats of re-

fusal to participate with independent water lines in through rates, absolutely to control the freight rates of the water carriers operating between Atlantic and Gulf ports, the effect being, it is alleged, to increase the freight rates of the water carriers far beyond a profitable basis for the service rendered to the detriment and often to the distress of the people of the Southwest.

STATE COMMISSIONS.

Wisconsin: Commutation Rates.

Albert B. Lieberman v. Chicago, Milwaukee & St. Paul.

Complaint alleging discrimination, in that the respondent has a commutation rate in effect between Oconomowoc and Milwaukee, and that it has withdrawn and refuses to restore a commutation rate between Watertown and Milwaukee; that the withdrawal of such rate is subjecting the citizens of Watertown to an "undue or unreasonable prejudice and disadvantage."

The respondent cannot be required to accept a less rate than the maximum rate prescribed by statute, unless it voluntarily publish a lower rate; and it cannot be compelled to establish commutation rates for a particular locality. When the citizens of a particular locality are subjected to "undue or unreasonable prejudice or disadvantage" by reason of the citizens of another locality enjoying a commutation rate, the commission has the power to order the railway company to establish such rates at both localities or to withdraw them from both; and in this case no unjust discrimination within the meaning of the statute exists and the petition is, therefore, dismissed.

COURT NEWS.

The Supreme Court of the United States on Monday last denied the motion for a rehearing in the case of the Waters-Pierce Oil Company in which the court had affirmed a decision by the Texas courts imposing a fine of \$1,600,000 on the oil company and forbidden it to do business in the state.

The United States Circuit Court of Appeals for the Eighth circuit has sustained the decision of the Federal district court of Nebraska, holding that the Union Stock Yards Company, South Omaha, Neb., is a common carrier and subject to laws regulating interstate commerce. The company was prosecuted for having attached a yard engine to a car that had been received in interstate commerce which was not properly equipped with safety appliances.

The Supreme Court of Indiana on April 9 declared constitutional the full-crew law of that state, passed in 1907, and judgment was affirmed against the Pittsburgh, Cincinnati, Chicago & St. Louis for running its fast mail train from Richmond to Indianapolis with a crew of only four men. The train consists of seven mail cars and no passenger coaches, and the crew consisted of the engineman, the fireman, conductor and one brakeman. The statute says that any passenger, mail or express train of five cars or more must have a flagman in addition to the four named. The company answered that the train is supplied with mechanical devices which make any additional brakeman or flagman unnecessary; that this train is engaged in interstate commerce, and that the regulations imposed by Congress are the only ones that can lawfully be imposed; also that as this is a mail train the exclusive power of Congress to establish post-offices and post roads is infringed. The court said it was not a statute regulating interstate commerce, but merely a police measure to provide for the safety of citizens, and as such did not unreasonably burden interstate commerce.

The Oklahoma Supreme Court has rendered a decision enjoining the State Corporation Commission from enforcing its order requiring the Atchison, Topeka & Santa Fe to put on additional passenger service between Guthrie, Okla., and Gainesville, Tex. Chief Justice Kane, who rendered the opinion, held that the Santa Fe's service between Guthrie and Purcell and between Purcell and Marietta is inadequate. He

said, however, that the court could not modify an order of the commission except in a rate case, and that since a part of the order was unreasonable it would have to be entirely reversed.

The Supreme Court of Texas on April 7 rendered a decision upholding the order of the State Railroad Commission requiring the Chicago, Rock Island & Gulf to establish and maintain a depot for the accommodation of freight and passengers at Texhoma, Tex. The town of Texhoma is on the state line between Texas and Oklahoma. On the Oklahoma side, about 870 ft. from the state line, there is a station on the Chicago, Rock Island & Pacific, which company controls the Chicago, Rock Island & Gulf. The avowed object of the State Commission in ordering the Chicago, Rock Island & Gulf to build and maintain a station on the Texas side of the line was to secure for the State Commission control of rates on interstate passengers and shipments of freight on these connecting lines between Oklahoma and Texas. Of course, if there is a station in Texas where interstate passengers can get off and buy tickets and where freight for Texas points can be reshipped, it will be impossible for the connecting lines to maintain higher rates on interstate shipments into and out of Texas than on intrastate business. The Chicago, Rock Island & Gulf appealed from the order of the commission, claiming that it was an unreasonable and unjust exercise of authority in view of the fact that there was a station so near on the Oklahoma side of the line, and that it was an unconstitutional interference with interstate commerce. The appellate court of Texas sustained this contention but the supreme court rules against it. The constitution and laws of Texas require that passengers and property shall be received at starting places, junctions, sidings and stopping places. The court says that it does not want to be understood as holding that the mere stopping of the rails of a road at the state line makes a point at which a station must be maintained; but the state line is in law and in fact one terminus of the line of a railway intersecting it, constructed by a Texas corporation, because the powers of such a corporation cease at that line. If there is no "place" there the mere ending of the track there does not bring into existence the duty defined in the statutes. But the evidence shows that Texhoma, Tex., is such a "place" as the statute contemplates. The statutes deal with Texas railways and impose duties to be performed in Texas. The places at which stations are to be established are to be in Texas and not elsewhere; and it follows that the Chicago, Rock Island & Gulf does not meet the statutory requirement by using the station of the Chicago, Rock Island & Pacific in another state.

Fine for Not Filing Tariffs.

The decision of the United States District Court for the Southern district of Illinois in the suit of the Government against the Illinois Terminal Company was reported in these columns March 5, page 475. The fine against the Terminal Company was \$12,000. The full decision, now at hand, shows that this punishment was based solely on the offense of transporting interstate freight for which the company had not filed and published tariffs. The freight, westbound, came from eastern connections but the Terminal Company had neither issued any tariff nor joined in any issued by the originating road. The fine was \$2,000 on each of six counts, and each count represented a carload of bottles carried less than 16 miles. The decision, by Judge Humphrey, says:

"Effective railway regulation must begin with publicity of rates. The penalty for failure on the part of any carrier subject to the act to regulate commerce to publish and file its rates is as severe as the penalty for failure to strictly observe such rates after filing.

"The line of the defendant railway is entirely within the state of Illinois. The defendant is, however, engaged in the transportation of property moving wholly by railway from one state to another state. It is, therefore, as much subject to the act to regulate commerce as it would be if it owned and operated a railway connecting the points in different states between which moved the commodities mentioned in the indictment.

"By the amendment of June 28, 1906, transportation by rail

of property moving in interstate commerce by a carrier which has not filed its rates for such service is a misdemeanor."

The fact that the failure to file the rates does not appear to have been part of any scheme to discriminate forbids great severity. The fact that the violation admitted is serious and goes to the very heart of the whole subject of railway regulation forbids that the penalty should be nominal. In view of all the circumstances the fine assessed upon this indictment is fixed at the sum of \$12,000.

Suit to Prevent Advance in Missouri Passenger Rates.

A temporary injunction restraining the railways in Missouri from increasing their passenger fares from 2 cents a mile to 3 cents was issued by Judge George H. Williams, of the state circuit court at St. Louis on April 9. The suit was brought by direction of Governor Hadley. Circuit Attorney Jones in his petition alleges that the 18 defendant roads have entered into a combination to fix passenger rates in violation of the state anti-trust law and of the state constitution. It is also alleged that the tariffs of the railways unconstitutionally discriminate in that they enable those who buy mileage books to get a rate as low as 2 cents a mile while those who purchase trip tickets must pay 3 cents a mile. The hearing of the suit has been postponed for several days. Meantime no advance in rates over 2 cents a mile has been made. The advance to 3 cents was to have been made on April 10. It is believed that further conferences between the state officials and the officers of the roads will be held and that a compromise may be arranged. Gov. Hadley and Attorney-General Major have disagreed about the policy to be pursued by the state, Mr. Major wishing to push the 2-cent fare suit in the federal court, while, as already stated, Gov. Hadley directed that the injunction proceeding be started in the state court.

Proposed Readjustment of Rates to Utah Common Points.

The Traffic Bureau of the Commercial Club of Salt Lake City has sent a petition to the heads of all the railways—E. H. Harriman, Geo. J. Gould, B. L. Winchell, Geo. B. Harris, E. P. Ripley, Frank Trumbull, E. T. Jeffery and W. A. Clark—asking for a readjustment of transcontinental freight rates on a basis that will be more favorable to Salt Lake City and other Utah points. The principal complaint is made against the fixing of higher rates from the East to Salt Lake City than to San Francisco. It is asserted that if accurate statistics were available analysis of them would show that so small a part of the transcontinental traffic actually is affected by water competition that the benefit that the roads derive from discriminating in favor of points having ocean transportation is negligible compared with the harm that they do to interior points. A basis for the readjustment of all the various rates to Utah common points is suggested as follows:

(1) Between Utah common points and the Missouri river and differential rate territories.—Class rates governed by the Western Classification between Utah common points and the territory east thereof, taking Missouri river rates, not to be higher than the proportion of the Omaha-Sacramento mileage between Omaha and Ogden, or 59 per cent. of the class rates currently applied between Omaha and Sacramento, with usual differentials applying on Mississippi river and farther east, and commodity rates between Chicago, Mississippi river, Missouri river and adjacent rate territories on the one hand and San Francisco on the other, to be maxima between the East and Utah common points.

(2) Between California and Utah common points.—Present percentage basis of current rates between Utah common points and Missouri river to apply on all traffic, all points taking California terminal rates.

(3) Between Colorado common points and Utah common points.—Present percentage basis of class rates between Utah common points and Missouri river to obtain, commodity rates to be fixed as may be found to the mutual interests of shippers and carriers.

(4) Between Leadville, Colo., and Utah common points.—Eighty per cent. of the current class rates.

(5) Local Rates.—Class rates not to exceed rates per mile on same line toward Salt Lake City from Denver, Butte, Portland, Sacramento, and Los Angeles; Salt Lake City and Ogden to be placed on a parity; commodity rates to be equitable and helpful to industrial interests.

(6) Passenger Rates.—Not to exceed 2½ cents a mile in Utah, Nevada, Idaho and Wyoming.

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF FEBRUARY, 1909.
(See also issue of April 9.)

Name of road.	Mileage operated at end of period.	Operating revenues				Operating expenses				Net operating revenues (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss), comp. with last year.	Increase (or dec.) last year.
		Freight.	Passenger.	Inc. misc.	Total.	Way and structures.	Maintenance of equipment.	Traffic.	Trans- portation.					
Baltimore & Ohio	3,992	\$3,789,897	\$842,911	\$4,955,670	\$666,902	\$849,730	\$136,223	\$1,902,282	\$3,683,575	\$1,272,095	\$46,000*	\$173,547	\$1,052,548	\$650,064
Buffalo, Rochester & Pittsburgh	568	402,407	56,182	470,589	36,983	133,067	36,480	154,206	12,839	344,551	77*	15,000	111,431	28,674
Chicago & Alton	998	571,897	260,133	832,030	76,424	263,077	38,401	308,609	12,839	344,551	981*	30,000	283,769	14,361
Chicago & Eastern Illinois	966	604,337	124,512	728,849	70,982	263,077	38,401	308,609	12,839	344,551	1,172*	26,500	225,605	11,041
Chicago, Indianapolis & Louisville	616	235,689	72,668	308,357	58,942	105,484	12,089	124,571	12,821	263,077	.....	21,500	713,800	25,260
Chicago, Rock Island & Pacific	7,414	2,847,713	1,112,621	3,960,334	356,445	605,286	104,070	1,854,248	81,221	3,001,254	9,819*	206,631	868,075	283,434
Cincinnati, Hamilton & Dayton	1,036	1,251,654	258,069	1,509,723	151,392	291,883	33,821	168,808	24,852	194,738	739	28,179	159,825	34,122
Cleveland, Cincinnati, Chic. & St. L.	2,516	1,018,743	258,069	1,276,812	151,392	291,883	33,821	168,808	24,852	194,738	739	28,179	159,825	34,122
Denver & Rio Grande	587	509,291	188,552	697,843	37,269	103,372	10,407	184,784	28,061	54,782	1,908*	21,138	770,277	338,353
El Paso & Southwestern Co.	584	131,200	188,552	319,752	117,896	102,220	10,407	184,784	28,061	54,782	1,908*	21,138	770,277	338,353
Florida East Coast	1,338	503,474	188,552	692,026	37,269	103,372	10,407	184,784	28,061	54,782	1,908*	21,138	770,277	338,353
Gastonia, Harrisburg & San Antonio	591	231,714	625,232	856,946	46,378	298,516	32,452	331,968	17,672	214,296	5,775*	15,307	230,051	72,629
Grand Rapids & Indiana	6,937	1,962,618	313,678	2,276,296	18,313	48,005	9,782	135,782	63,150	208,488	14*	15,307	230,051	72,629
Iowa Central	724	248,370	46,478	294,848	26,234	78,823	9,436	115,572	11,547	127,019	15,726*	54,366	185,950	216,787
Lake Erie & Michigan Southern	1,511	1,766,615	58,826	1,825,441	18,313	48,005	9,782	135,782	63,150	208,488	14*	15,307	230,051	72,629
Lake Shore & St. Louis Ry.	1,027	1,766,615	58,826	1,825,441	18,313	48,005	9,782	135,782	63,150	208,488	14*	15,307	230,051	72,629
Minneapolis & St. Louis	2,395	557,923	148,393	706,316	78,823	9,436	11,547	127,019	11,547	127,019	15,726*	54,366	185,950	216,787
Minneapolis, St. Paul & S. M. Ry.	1,230	687,687	170,721	858,408	164,054	168,667	32,925	225,161	25,821	716,628	56,852*	353,269	837,236	216,787
Nashville, Chattanooga & St. Louis	3,587	3,620,212	1,755,045	5,375,257	1,302,792	147,535	32,925	225,161	25,821	716,628	56,852*	353,269	837,236	216,787
New York, Chicago & Hudson	556	549,161	73,392	622,553	43,063	111,283	14,750	235,970	12,939	534,005	8,300*	12,500	109,378	82,232
New York, Chicago & St. Louis	546	470,669	66,979	537,648	58,306	102,493	9,366	232,070	14,169	427,634	6,600*	5,200	71,388	64,871
Norfolk & Southern	582	140,076	43,469	183,545	19,502	20,573	3,725	23,297	12,931	118,161	6,930*	71,302	270,382	200,431
Oregon R. & Navigation Co.	1,456	536,973	216,923	753,896	69,232	65,589	24,126	216,723	30,536	465,376	6,930*	71,302	270,382	200,431
Philadelphia & Reading	1,006	2,693,001	427,393	3,120,394	225,868	503,041	33,196	381,706	52,048	1,751,929	27,497	61,369	1,029,502	358,766
St. Louis Southwestern	773	445,037	90,919	535,956	82,743	64,784	8,577	139,555	14,701	315,554	300*	8,500	46,534	26,781
St. Louis Southwestern of Texas	697	195,421	56,453	251,874	46,627	75,754	4,513	119,585	15,507	368,774	2,911*	23,391	160,251	137,830
St. Louis Southwestern of Pa.	727	171,824	209,430	381,254	56,503	184,229	24,860	184,229	43,698	953,527	6,222*	54,053	456,337	160,460
San Antonio & Aransas Pass	1,099	295,952	209,430	505,382	185,084	207,721	53,148	463,876	43,698	953,527	6,222*	54,053	456,337	160,460
San Pedro, Los Ang. & Salt Lake	2,613	1,004,310	319,424	1,323,734	803,002	780,639	98,074	1,637,814	187,263	3,506,926	6,290*	245,038	1,917,195	328,491
Seaboard Air Line	2,598	3,324,231	1,937,114	5,261,345	1,741,160	352,945	70,663	796,652	87,263	1,461,663	3,027*	28,215	332,206	121,360
Southern Pacific-Pac. System	2,515	1,283,565	412,681	1,696,246	45,789	84,955	23,322	232,508	21,938	1,409,512	7	29,346	92,681	24,131
Wabash	1,131	414,258	81,661	495,919	531,532	1,848,350	629,836	195,660	1,813,097	1,628,820	3,431	255,296	1,396,955	19,138
Wisconsin Central	1,131	414,258	81,661	495,919	531,532	1,848,350	629,836	195,660	1,813,097	1,628,820	3,431	255,296	1,396,955	19,138
Baltimore & Ohio	3,992	\$3,789,897	\$842,911	\$4,955,670	\$666,902	\$849,730	\$136,223	\$1,902,282	\$3,683,575	\$1,272,095	\$46,000*	\$173,547	\$1,052,548	\$650,064
Buffalo, Rochester & Pittsburgh	568	402,407	56,182	470,589	36,983	133,067	36,480	154,206	12,839	344,551	77*	15,000	111,431	28,674
Chicago & Alton	998	571,897	260,133	832,030	76,424	263,077	38,401	308,609	12,839	344,551	981*	30,000	283,769	14,361
Chicago & Eastern Illinois	966	604,337	124,512	728,849	70,982	263,077	38,401	308,609	12,839	344,551	1,172*	26,500	225,605	11,041
Chicago, Indianapolis & Louisville	616	235,689	72,668	308,357	58,942	105,484	12,089	124,571	12,821	263,077	.....	21,500	713,800	25,260
Chicago, Rock Island & Pacific	7,414	2,847,713	1,112,621	3,960,334	356,445	605,286	104,070	1,854,248	81,221	3,001,254	9,819*	206,631	868,075	283,434
Cincinnati, Hamilton & Dayton	1,036	1,251,654	258,069	1,509,723	151,392	291,883	33,821	168,808	24,852	194,738	739	28,179	159,825	34,122
Cleveland, Cincinnati, Chic. & St. L.	2,516	1,018,743	258,069	1,276,812	151,392	291,883	33,821	168,808	24,852	194,738	739	28,179	159,825	34,122
Denver & Rio Grande	587	509,291	188,552	697,843	37,269	103,372	10,407	184,784	28,061	54,782	1,908*	21,138	770,277	338,353
El Paso & Southwestern Co.	584	131,200	188,552	319,752	117,896	102,220	10,407	184,784	28,061	54,782	1,908*	21,138	770,277	338,353
Florida East Coast	1,338	503,474	188,552	692,026	37,269	103,372	10,407	184,784	28,061	54,782	1,908*	21,138	770,277	338,353
Gastonia, Harrisburg & San Antonio	591	231,714	625,232	856,946	46,378	298,516	32,452	331,968	17,672	214,296	5,775*	15,307	230,051	72,629
Grand Rapids & Indiana	6,937	1,962,618	313,678	2,276,296	18,313	48,005	9,782	135,782	63,150	208,488	14*	15,307	230,051	72,629
Iowa Central	724	248,370	46,478	294,848	26,234	78,823	9,436	115,572	11,547	127,019	15,726*	54,366	185,950	216,787
Lake Erie & Michigan Southern	1,511	1,766,615	58,826	1,825,441	18,313	48,005	9,782	135,782	63,150	208,488	14*	15,307	230,051	72,629
Lake Shore & St. Louis Ry.	1,027	1,766,615	58,826	1,825,441	18,313	48,005	9,782	135,782	63,150	208,488	14*	15,307	230,051	72,629
Minneapolis & St. Louis	2,395	557,923	148,393	706,316	78,823	9,436	11,547	127,019	11,547	127,019	15,726*	54,366	185,950	216,787
Minneapolis, St. Paul & S. M. Ry.	1,230	687,687	170,721	858,408	164,054	168,667	32,925	225,161	25,821	716,628	56,852*	353,269	837,236	216,787
Nashville, Chattanooga & St. Louis	3,587	3,620,212	1,755,045	5,375,257	1,302,792	147,535	32,925	225,161	25,821	716,628	56,852*	353,269	837,236	216,787
New York, Chicago & Hudson	556	549,161	73,392	622,553	43,063	111,283	14,750	235,970	12,939	534,005	8,300*	12,500	71,388	64,871
New York, Chicago & St. Louis	546	470,669	66,979	537,648	58,306	102,493	9,366	232,070	14,169	427,634	6,600*	5,200	71,388	64,871
Norfolk & Southern	582	140,076	43,469	183,545	19,502	20,573	3,725	23,297	12,931	118,161	6,930*	71,302	270,382	200,431
Oregon R. & Navigation Co.	1,456	536,973	216,923	753,896	69,232	65,589	24,126	216,723	30,536	465,376	6,930*	71,302	270,382	200,431
Philadelphia & Reading	1,006	2,693,001	427,393	3,120,394	225,868	503,041	33,196	381,706	52,048	1,751,929	27,497	61,369	1,029,502	358,766
St. Louis Southwestern	773	445,037	90,919	535,956	82,743	64,784	8,577	139,555	14,701	315,554	300*	8,500	46,534	26,781
St. Louis Southwestern of Texas	697	195,421	56,453	251,874	46,627	75,754	4,513	119,585	15,507	368,774	2,911*	23,391	160,251	137,830
St. Louis Southwestern of Pa.	727	171,824	209,430	381,254	56,503	184,229	24,860	184,229	43,698	953,527	6,222*	54,053	456,337	160,460
San Antonio & Aransas Pass	1,099	295,952	209,430	505,382	185,084	207,721	53,148	463,876	43,698	953,527	6,222*	54,053	456,337	160,460
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Seaboard Air Line	2,598	3,324,231	1,937,114	5,261,345	1,741,160	352,945	70,663	796,652	87,263	1,461,663	3,027*	28,215	332,206	121,360
Southern Pacific-Pac. System	2,515	1,283,565	412,681	1,696,246	45,789	84,955	23,322	232,508	21,938	1,409,512	7	29,346	92,681	24,131
Wabash	1,131	414,258	81,661	495,919	531,532	1,848,350	629,836	195,660	1,813,097	1,628,820	3,431	255,296	1,396,955	19,138
Wisconsin Central	1,131	414,258	81,661	495,919	531,532	1,848,350	629,836	195,660	1,813,097	1,628,820	3,431	255,296	1,396,955	19,138

*Deficit. †Loss.

Car Surpluses and Shortages.

Arthur Hale, Chairman of the Committee on Car Efficiency of the American Railway Association, in presenting bulletin No. 43 B, giving a summary of car surpluses and shortages by groups from February 19, 1908, to March 31, 1909, says:

"The total surplus for this report is 296,600 cars, an increase of 5,182 since our last fortnightly bulletin. There is a decrease of 11,451 in surplus coal and gondola cars, and an increase of 12,885 in box. Eliminating the Canadian group, which shows an increase of 4,767, there is practically no change in the net situation in the United States.

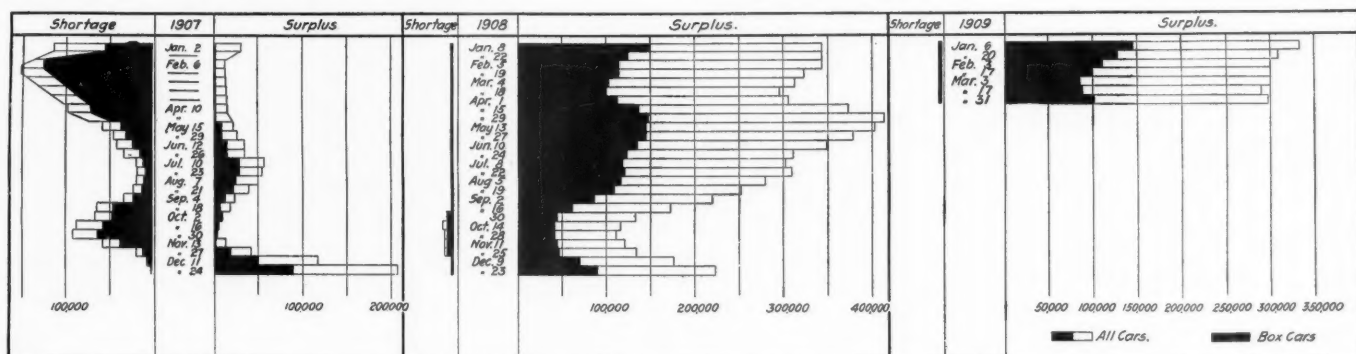
Railroad Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

O. B. Huntsman has been elected a Vice-President of the Texas & Pacific.

Frederick W. Stevens, General Counsel of the Pere Marquette, has resigned to become associated with J. P. Morgan & Co., of New York.



Car Surpluses and Shortages in 1907, 1908 and 1909.

"There are decreases in groups 1 (New England), 2 (Eastern), 3 (Middle) and 8 (Middle Western), which are offset by increases in groups 4 (South Atlantic), 6 (Northwestern), 9 (Southwestern) and 10 (Pacific).—Groups 2 (Eastern) and 3 (Middle), which include the heaviest coal handling roads, show substantial decreases in coal and gondola cars, while

J. R. Parrott, Vice-President and General Manager of the Florida East Coast, has been elected President and General Manager, succeeding as President, H. M. Flagler, who remains Chairman of the Board of Directors.

Y. van den Berg, formerly First Vice-President of the Louisville & Nashville, and until recently connected with Laden-

CAR SURPLUSES AND SHORTAGES, FEBRUARY 19, 1908, TO MARCH 31, 1909, INCLUSIVE.

Date.	Number of roads.	Surpluses.				Shortages.			
		Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Box.	Flat.	Coal, gondola and hopper.	Other kinds.
March 31, 1909.....	158	101,344	20,428	128,546	46,282	296,600	158	98	116
March 17, 1909.....	161	88,459	20,328	139,997	42,634	291,418	310	74	27
February 17, 1909.....	159	98,512	23,924	135,208	43,797	301,441	266	97	11
February 3, 1909.....	165	110,632	26,121	122,711	42,107	301,571	97	31	49
January 20, 1909.....	162	127,204	26,723	116,680	41,057	311,664	163	21	139
January 6, 1909.....	156	146,255	25,383	117,686	43,695	333,019	170	202	120
December 23, 1908.....	158	87,350	16,247	79,595	38,885	222,077	471	42	289
December 9, 1908.....	161	67,550	15,336	58,816	33,941	175,643	1,134	73	276
November 25, 1908.....	160	45,194	12,157	43,854	31,624	132,829	7,923	178	900
October 28, 1908.....	158	39,383	10,185	31,541	29,803	110,912	8,175	167	2,261
September 30, 1908.....	160	42,593	10,365	49,795	31,039	133,792	7,313	450	224
August 19, 1908.....	160	106,367	13,494	92,500	40,642	253,003	465	90	105
July 22, 1908.....	166	120,580	14,401	125,739	47,960	308,680	115	37	330
June 24, 1908.....	163	123,112	18,042	130,149	41,995	313,298	266	34	120
May 27, 1908.....	160	144,697	20,075	162,695	54,437	381,904	82	13	12
April 29, 1908.....	159	147,971	24,350	186,742	59,542	413,605	145	42	16
March 18, 1908.....	160	103,509	25,122	119,205	49,206	297,042	533	151	250
February 19, 1908.....	161	113,776	30,088	134,217	44,432	322,513	697	141	249

there are also slight decreases in these classes in groups 5 (Southern) and 6 (Northwestern)."

The accompanying table shows the surpluses and shortages for the period covered by the report and the chart shows the surpluses and shortages for 1907, 1908 and 1909.

Crop Conditions.

The crop reporting board of the bureau of statistics estimates that the average condition of winter wheat on April 1 was 82.2 per cent. of a normal, against 91.3 on April 1, 1908; 89.9 on April 1, 1907, and 86.6 the average condition for the past ten years on April 1. The decline in condition from December 1, 1908, to April 1, 1909, was 3.1 points as compared with an average decline in the past ten years of 6.0 points.

The average condition of rye on April 1 was 87.2 per cent. of a normal against 89.1 on April 1, 1908, and 89.2 the average condition for the past ten years on April 1.

A recent issue of the *Diario*, published in Lima, Peru, contains the budget proposals for 1909 for the district of Arequipa, Peru, and includes a sum of \$10,000,000 for the construction of a highway or railway to Majes and Camana.

berg, Thalmann & Co., New York, has opened an office at 32 Nassau street, New York, to engage in the valuation and investigation of railway properties.

Richard A. Jackson, First Vice-President and General Solicitor of the Chicago, Rock Island & Pacific, has been elected President of the Rock Island Company, succeeding Robert Mather, resigned to become Chairman of the Board of Directors of the Westinghouse Electric & Manufacturing Co. He was born September 5, 1858, at Richmond, Ind. He graduated from Earlham College in 1876 and from the University of Virginia in 1879. In 1900 he became General Attorney of the Chicago, Rock Island & Mexico, now a part of the Chicago, Rock Island & Gulf. In August, 1902, he was appointed General Attorney of the Chicago, Rock Island & Pacific, and in November, 1904, was elected First Vice-President and General Solicitor.

Operating Officers.

D. C. Noonan, General Superintendent of the Minneapolis & St. Louis and the Iowa Central, has resigned.

C. E. Taylor, General Agent of the Atchison, Topeka & Santa Fe, has been appointed the Superintendent of Terminals at Chicago, succeeding C. B. Strohm, promoted.

S. C. Stickney having, on March 31, resigned as General

Manager of the Chicago Great Western, the duties of that office will be directly assumed by the receivers.

J. B. Flaherty, Trainmaster of the Midland Terminal, the Colorado Springs & Cripple Creek and the Florence & Cripple Creek, has been appointed the Superintendent, with office at Cripple Creek, Colo.

Wallace H. Gephart, General Superintendent of the Central of Pennsylvania, has been elected the President and General Manager, succeeding Col. C. M. Clement, President, resigned. The office of General Superintendent has been abolished.

Arthur P. Herbert, Superintendent of the Colima division of the National Railways of Mexico, has resigned and his former office has been abolished. The jurisdiction of the Superintendent of the Guadalajara division has been extended over the Colima division to Manzanillo.

C. W. Bradshaw, Superintendent of the Atlantic division of the Louisville & Nashville, with office at Etowah, Tenn., has been transferred as Superintendent to the Louisville, Cincinnati & Lexington division, with office at Louisville, Ky., succeeding C. A. Davies, deceased. A. B. Bayless, Assistant Superintendent of the Atlantic division, succeeds Mr. Bradshaw, with office at Etowah, and the position of Assistant Superintendent of the Atlantic division has been abolished.

Traffic Officers.

F. H. Behring has resumed his duties as an Assistant General Freight Agent of the Southern Railway, with office at Louisville, Ky.

George C. Conn, General Freight Agent of the Minneapolis, St. Paul & Sault Ste. Marie, has been appointed the Freight Traffic Manager of the Pere Marquette, succeeding J. N. Tittemore, resigned.

H. Lawton, formerly Freight Traffic Manager of the Mexican Central, has been appointed the General Freight and Passenger Agent of the Cananea, Yaqui River & Pacific and the Sonora Railway, with office at Guaymas, Sonora, Mexico, succeeding M. O. Bicknell, resigned.

W. A. Turner has been appointed a General Freight Agent of the Southern Railway, with office at Chattanooga, Tenn., reporting direct to the Assistant Freight Traffic Manager. The commercial offices at Chattanooga, Tenn., Nashville, New Orleans, La., and Dallas, Tex., will report direct to Mr. Turner. E. C. Morgan has been appointed a Commercial Agent at Chattanooga.

Engineering and Rolling Stock Officers.

L. L. Dawson has been appointed the Superintendent of Motive Power of the Ft. Worth & Denver City.

T. H. Crowell, Principal Assistant Engineer of the Northern Pacific, has been appointed the Chief Engineer of the Spokane, Portland & Seattle and the Astoria & Columbia River, with office at Portland, Ore.

W. J. Hill, General Foreman of the Atchison, Topeka & Santa Fe, has been appointed the Master Mechanic of the Oklahoma division, with office at Arkansas City, Kan., succeeding J. T. Lendrum, transferred.

Purchasing Officers.

J. Lowell White has been appointed the Purchasing and Supply Agent of the St. Louis, Brownsville & Mexico, with office at Kingsville, Tex.

OBITUARY.

William H. Sayre, First Vice-President of the Lehigh Valley Coal Co., New York, and Secretary and Treasurer of the Buffalo Creek Railroad, died at Bethlehem, Pa., April 7.

Levi B. Paxson, Consulting Mechanical Engineer of the Philadelphia & Reading, died April 10 at Reading, Pa. He was born in 1827 in Chester county, Pa., and began railway work on the Philadelphia & Reading as a brakeman. He later became Master Mechanic and then Engineer of Machinery. By 1888 he had become Superintendent of Motive Power. In August, 1899, he was made Consulting Mechanical Engineer.

Colin A. Davies, Superintendent of the Cincinnati division of the Louisville & Nashville, died on April 8, at Louisville,

Ky., following a short illness from peritonitis. He was born March 15, 1855, at Louisville, Ky. After receiving an education in the public schools of Louisville he began railway work in 1871 as a rodman on an engineering corps of the Cumberland & Ohio, now a part of the Louisville & Nashville. From 1871 to 1881 he was connected with various engineering corps. In 1881 he was made Principal Engineer in charge of construction of the Pensacola & Atlantic division of the Louisville & Nashville. From March, 1883, to January, 1890, he was a Roadmaster of the various divisions of the same road. In January, 1890, he was appointed Assistant Superintendent at Birmingham, Ala., and in March, 1891, he was made Superintendent of the Cincinnati division at Louisville.

Major Lewis F. Rice, Architect and Civil Engineer, died April 12 at his home in Brookline, Mass. He was a graduate of Rensselaer Polytechnic Institute, and after graduation served for about a year as Engineer on Construction of the Brooklyn water works. He was later made Division Engineer of the Troy & Greenfield, now part of the Boston & Maine. In 1865 he became Assistant Engineer of the Reading & Columbia, now the Philadelphia & Reading. From 1871 to 1890 he was engaged in general practice as a civil engineer in Boston, Mass.

Benjamin Perry McDonald, of Ft. Scott, Kan., died on February 16 at Dallas, Tex. He was born at Lock Haven, Pa., on October 8, 1839. He moved to Kansas August 1, 1857,



B. P. McDonald.

and has since been identified with the growth of that state. In 1866 he was elected Mayor of Ft. Scott and at the expiration of his term was re-elected. He early engaged in the mercantile and banking business and organized the First National Bank of Ft. Scott in January, 1871. He was elected a Director of the Missouri, Kansas & Texas at its annual meeting on May 15, 1872, and remained a director until his death. In 1873 he was elected to the Legislature of Kansas. In 1874 he built the line southeast from Ft. Scott to the coal fields, 12 miles, which was afterwards bought by the Kansas City, Ft. Scott & Memphis. In 1881 he built 20 miles of railway on Long Island, New York, which is now part of the property of the Long Island Railroad. In 1888 and 1889 he built the Sherman, Denison & Dallas, now a part of the Missouri, Kansas & Texas Railway of Texas, and in 1901 and 1902 built the Ft. Scott, Iowa & Western, now owned and operated by the Missouri, Kansas & Texas. In 1902 he organized and built the Dallas, Cleburne & Southwestern, from Cleburne to Egan, Tex., of which company he was the President at the time of his death. This railway is now operated under a trackage contract by the Missouri, Kansas & Texas Railway of Texas. He was a Director of the Kansas City, Ft. Scott & Memphis and its predecessor companies from their earliest history until they were taken over by the St. Louis & San Francisco. He lived in Kansas when the Southern branch of the Union Pacific, now the Missouri, Kansas & Texas, was originally incorporated, knew the incorporators, and was always a great friend of the enterprise. In those early days his aid and support was of great benefit to the company. During the Receivership of H. C. Cross and George A. Eddy he was appointed by them as their Treasurer, and served as such during their whole term. He was one of the strong men of the West and his acquaintance was broad. People and employees knew him and respected him. He was of sound judgment and absolute honesty. He had a more intimate knowledge of the Missouri, Kansas & Texas history than any other man. He was buried from his old home at Ft. Scott, Kan.

Railroad Construction.

New Incorporations, Surveys, Etc.

ATCHISON, TOPEKA & SANTA FE.—The double-tracking work between Wyaconda, Mo., and Bucklin, 42 miles, has been resumed. Contracts for the improvements are let.

BENNETTSVILLE & CHERAW.—An officer writes that work will begin about April 19 on extension of the main line from Drakes, S. C., southeast to Brownsville, 6.6 miles, and that this line will be open for traffic about August 15. G. P. Bourdelat, Traf. Mgr., Bennettsville, S. C. (April 9, p. 820.)

BLUE VALLEY TRACTION.—Incorporated in Missouri to build an electric line from Raytown, Mo., to and within the corporate limits of Kansas City, about 10 miles in all. The directors include: U. S. Epperson, J. M. Lowe, M. M. Sweetland, C. C. Craver, Jas. W. Jones, J. M. Devine, H. M. Dickson, Sam T. McDermott and C. W. German.

CANADIAN PACIFIC.—According to press reports, a contract was recently given to Omaha contractors to build 80 miles of new line between Lethbridge, Alb., and Calgary.

The Sheho section of the Central division has been extended from Leslie, Sask., westward to Wynwood, 22 miles.

CENTRAL RAILROAD OF NEW JERSEY.—An officer writes that a contract was given recently to Chas. A. Sims & Co. for grading work from Bowentown, N. J., east to Bridgeton, about three miles.

CLARION & EAST BRADY (ELECTRIC).—An officer writes that the surveys will be completed by May 1, and that construction work will begin within 30 or 60 days after that time. (Jan. 29, p. 235.)

CLEVELAND, SOUTHWESTERN & COLUMBUS (ELECTRIC).—An officer writes that this company has begun operating the new connecting link in Ohio between its southern division and the old Mansfield-Bucyrus division, 45 miles. The new line was built for high-speed operation on a private 60-ft. right-of-way through Leroy, Lodi, West Salem, Polk, Nankin and Ashland to Mansfield. This improvement completes a connection from Cleveland south via Bucyrus to Columbus, and over other lines west via Springfield and Dayton to Indianapolis, Ind.

CLINTON & OKLAHOMA WESTERN.—Projected from Clinton, Okla., northwest to Trinidad, Colo., and from Clinton southeast to Lehigh, in all 400 miles. According to press reports grading has been begun from Clinton, Okla., northwest to Butler. It is intended to have the work on this section, including a steel bridge over the Washita river, finished in about five months. T. J. Nance, Pres., and J. H. O'Hearn, engineer in charge, both of Clinton. (Dec. 4, p. 1500.)

CONCHO, SAN SABA & LLANO VALLEY.—Chartered in Texas with \$200,000 capital and headquarters at Miles, Runnels county, to build a line from San Angelo, in Tom Green county, southeast to San Antonio, about 235 miles. Surveys now being made. The first section to be built will be from Miles southeast to Paintrock. Much land and many bonuses are said to have been arranged for by property owners along the proposed route, and all financial arrangements made to carry out the work. It is expected to have the line finished by the fall of 1910. D. E. Simms, Pres.; R. A. Love, First V.-Pres. and Gen. Mgr., Kansas City, Mo.; S. Roach, Second V.-Pres., and T. K. Wilson, Chairman of the board of directors.

CUMBERLAND NORTHERN.—Incorporated in Kentucky to build from Artemus, Knox county, Ky., north to Beattyville, about 75 miles. An officer writes that surveys are now being made and construction will begin as soon as the surveys are completed. E. L. Thomas, Secy. and Treas., Knoxville, Tenn.

CUMBERLAND RIVER & NASHVILLE.—Projected from Corbin, Ky., west to Burnside, thence southwest to the Tennessee state line 100 miles, and from that point under the name of the Nashville & Northwestern to Clarkville, Tenn., 60 miles; work under way by the Monticello Construction Co. from Burnside, Ky., southwest to Monticello, 20 miles; grading finished on 13 miles. Plans are said to be ready for the steel bridge

over the Cumberland river to be 1,100 ft. long and 190 ft. high. (March 19, p. 653.)

CUYUNA RANGE.—An officer writes that work will begin this summer on the proposed line from Deerwood, Minn., east to Duluth, about 125 miles. Cuyler Adams, Pres. and Gen. Mgr., Deerwood. (Oct. 30, p. 1274.)

DELAWARE & HUDSON.—The report of this company for the year ended Dec. 31, 1908, says that the extension of the Quebec, Montreal & Southern from Pierreville, Que., to Ste. Philomene has been completed with the exception of the bridge at Nicolet. It is expected that the new line will be placed in operation about May 1. (Dec. 18, p. 1608.)

The Salem branch of the Greenwich & Johnsonville, connecting the Rutland and Washington branch of the D. & H. with the main line of the G. & J., has been completed and put in operation.

GREAT NORTHERN.—The Vancouver, Victoria & Eastern, from Blaine, Wash., northwest to New Westminster, B. C., 22.8 miles, has been opened to operation.

GREENWICH & JOHNSONVILLE.—See Delaware & Hudson.

HARRISON & MINERAL BELT.—Incorporated in Arkansas to build from Appleton, Ark., northwest to Harrison. It is intended to later extend the line northeast, via Protem, Mo., Houston and Salem to St. Louis, also southeast to Paris, Texas, making about 550 miles in all. J. R. Newman, Pres.; L. A. Saffer, Vice-Pres.; J. A. Flinn, Secy.; J. E. Northern, Genl. Mgr., and T. A. Norton, Ch. Engr., all of Harrison, Ark. (Nov. 27, p. 1460.)

INDIANA ROADS (ELECTRIC).—Plans are said to have been made to build a network of interurban lines connecting the principal cities in the Calumet region, including Gary, Hammond, East Chicago, Indiana Harbor and Whiting. The following companies are said to have franchises in these cities: Crown Point-Gary Co., Gary-Hobart-Valparaiso Traction Co., Hammond, Whiting & East Chicago Electric Co., Indianapolis-Chicago Traction Co., South Chicago Street Railway Co., and the Chicago, Lake Shore & South Bend Traction now operating a line connecting a few of the cities and which now proposes to build feeder branch lines.

INDIAN CREEK VALLEY.—According to press reports, surveys have been made, and construction is to be started this spring, on a new branch east to Normalville, Pa. (March 19, p. 665.)

LEWIS CREEK.—Incorporated in Alabama, with \$30,000 capital, to build from Toinette, Washington county, Ala., to Skidder, about 40 miles. G. E. Cochrane and J. T. Cochrane, of Mobile, are interested.

MISSISSIPPI BELT LINE & TERMINAL.—Organized to build a terminal line connecting with several of the railways entering Jackson, Miss. Construction contract reported let to J. T. Crass and work is to be started about May 1. R. L. Bradley, of Jackson, Miss., is interested.

MISSOURI, OKLAHOMA & GULF.—According to press reports this company, now operating a line from Wagoner, Okla., south to Calvin, 106 miles, has financial arrangement made for extension from Calvin south to Dennison, Tex., 111 miles. It is expected that funds will be ready for extension from Wagoner north to Joplin, Mo., as soon as the work on the southern end is finished. (March 16, p. 656.)

NATIONAL RAILWAYS OF MEXICO.—According to press reports, Consul Charles M. Freeman, at Durango, Mexico, has given out a statement regarding the proposed line from that place southwest about 150 miles to the port of Mazatlan, on the Pacific coast, as follows: An agreement was made Jan. 7 in the City of Mexico between the National Railways of Mexico, the State of Durango, and the Maderero de Durango Co., of Durango, whereby the National Railways of Mexico are to begin work within four months on the line. The first 62 miles to be finished by August, 1910. The Maderero de Durango Co. wants the line built to secure an outlet for its timber from points along the proposed line. It is expected that about 2,000 men will be put at work on the line. The State of Durango and the Maderero de Durango Co. guarantee 6 per cent. interest on \$1,992,000 U. S. currency for ten years. The agreement entered into does not call for the completion of the line to

Mazatlan, but only for 62 miles or as much more as can be finished for the \$1,992,000 exclusive of the cost of rolling stock. (Feb. 12, p. 331.)

According to press reports, the old surveys for a lighter grade between Irapuato, Mex., and Guadalajara, made by the Mexican Central, are to be revised. The present grade of 2 per cent. is to be reduced to less than 1 per cent. before laying heavy rails, from Mexico City west to Guadalajara.

NORFOLK & WESTERN.—An officer writes that the work in Ohio, for which arrangements have been made, is as follows: Contract let to J. O'Kelly Construction Co., contractors, Ashland, Ky., for the first section east of Coal Grove. The remaining two sections east of Portsmouth, Ohio, will be completed by company forces.

The fourth section, between Higby, Ohio, and Renick, 11.2 miles, is being graded by company forces. Contract let to Jones Bros., contractors, Columbus, Ohio, for the masonry work on this section.

The fifth section, from Lockbourne, Ohio, to Valley Crossing, 4.7 miles, is being graded by company forces. Contract let to Jones Bros., contractors, Columbus, Ohio, for the masonry work on this section. (April 9, p. 821.)

OKLAHOMA & MIDLAND (ELECTRIC).—This company, it is said, wants to hear from contractors at once to build three miles of city line. H. H. Hoover, President, 207 E. Fourth street, Hobart, Okla.

PHILADELPHIA & READING.—Sealed proposals for work of construction in connection with the elimination of grade crossings on the Philadelphia, Germantown & Norristown, will be received at the office of the Chief Engineer, 520 Reading Terminal, Philadelphia, Pa., until May 11, 1909, as follows:

Contract No. 1.—Masonry, trestle and embankment from the south side of Green street to the south side of Brown street.

Contract No. 2.—Foundations for the steel viaduct from the south side of Brown street to the north side of Jefferson street.

Contract No. 3.—Bridges and viaduct ready for ballast from the south side of Green street to the north side of Jefferson street.

Contract No. 12.—Masonry, embankment, paving, water and drainage systems, fence and gates, new office building, scale foundation, concrete steps and pavement for yard at Master street.

PORT O'CONNOR, RIO GRANDE & NORTHERN.—Organized to build from Port O'Connor, Tex., north to San Antonio, 190 miles, with a number of branches, including one to Gonzales, in all 234 miles, of which about 100 miles is graded. According to press reports \$350,000 is available and work is to be started at once from Victoria, Tex., south through Calhoun county to Port O'Connor. As soon as this section is finished work will be started north from Victoria to Yoakum, Gonzales and to San Antonio. (March 19, p. 657.)

QUEBEC, MONTREAL & SOUTHERN.—See Delaware & Hudson.

TEXAS ROADS.—Plans are said to have been made by N. P. Loash, Waterloo, Iowa, to build about 50 miles of railway north from Big Springs, Texas.

TOLEDO, ST. LOUIS & NEW ORLEANS.—Organized some time ago to build from Effingham, Ill., south to Brookport, on the Ohio river, opposite Paducah, Ky. According to press reports the project is being revived, and it is understood will be built as a joint terminal and belt railway for several lines that want to reach the Ohio and Mississippi river sections. N. M. Burns, Pres., St. Louis, Mo.; D. Reid, V.-Pres., Marion, Ill.; H. S. Ames, Treas., St. Louis, Mo., and T. W. Hall, Sec., Carmi, Ill.

TRINITY VALLEY SOUTHERN.—Plans are said to be under consideration to extend this road, now in operation from Dodge, Texas, east to Oakhurst, 6½ miles, southeast to Coldspring, 15 miles.

VALLEY ELECTRIC.—An officer writes that the route of this proposed line is from Hood River Valley, Ore., through the valley of the same name for about 20 miles. Surveys not yet finished. The work will include a steel bridge 75 ft. long, one of 100 ft. and some small trestles. E. F. Tolls, Pres.; H. B. Langille, Ch. Engineer, Hood River, Ore. (March 26, p. 727.)

VANCOUVER, VICTORIA & EASTERN.—See Great Northern.

Railroad Financial News.

ATCHISON, TOPEKA & SANTA FE.—The company has asked the Kansas Railroad Commission for permission to issue \$73,000,000 common stock. This is part of \$148,000,000 authorized before the railway commission law of Kansas came into effect, and the present application is to guard against any possible technical objection to the conversion of outstanding convertible bonds into stock.

CAROLINA, CLINCHFIELD & OHIO.—Blair & Co., New York, are offering the unsold portion of \$10,000,000 first mortgage 5 per cent. bonds of 1908-1938 at 96, to yield over 5¼ per cent. These are part of an authorized issue of \$15,000,000, of which \$5,000,000 are reserved for extensions, equipment and other future needs. The bonds are secured by a first lien on 238 miles of road from Fink, Va., to Spartanburg, S. C., and by a lien on the branch from Fink, Va., to Dante, 7¼ miles. The Carolina, Clinchfield & Ohio was described in the *Railroad Age Gazette* March 19.

CENTRAL NEW ENGLAND.—The company has asked the New York Public Service Commission, Second district, for permission to issue \$12,910,000 50-year 4 per cent. bonds for refunding all of the outstanding obligations of the company. The Central New England is a consolidation of the Newburgh, Dutchess & Connecticut, Poughkeepsie & Eastern, Poughkeepsie Bridge Company and the Dutchess County Railroad. It is proposed to issue immediately \$9,533,000 to refund the outstanding obligations of the consolidated company. The remainder of the proposed issue is to be used as opportunity offers to take up or discharge other obligations of the company which become due at different dates in the future.

COLORADO & NORTHWESTERN.—The property of the company was sold at auction on March 29 to a representative of the bondholders' reorganization committee, and the successor company, the Denver, Boulder & Western, was to take possession on April 1.

DENVER, BOULDER & WESTERN.—See Colorado & Northwestern.

JAMESTOWN, FRANKLIN & CLEARFIELD.—See Lake Shore & Michigan Southern.

LAKE SHORE & MICHIGAN SOUTHERN.—Stockholders are to vote May 5 on approving a contract for the lease of the Jamestown, Franklin & Clearfield, recently formed by consolidation of Lake Shore subsidiaries, to the Lake Shore & Michigan Southern.

MICHIGAN CENTRAL.—The directors have authorized an issue of \$25,000,000 4 per cent. debentures of 1909-1929, of which \$10,000,000 are to be sold in the near future to reimburse the company for advances made to the Detroit River Tunnel Co. Of the remaining \$15,000,000 debentures part are to be sold to retire \$10,000,000 5 per cent. notes maturing February, 1910.

NEW ENGLAND INVESTMENT & SECURITIES CO.—See New York, New Haven & Hartford.

NEW YORK CITY RAILWAY.—The old North Mount Morris Railroad, 1.57 miles long, and the only road owned by the New York City Railway, was sold at auction to John Johnson, of Brooklyn, N. Y., for \$500. The purchaser assumed about \$25,000 franchise taxes and assessments.

NEW YORK, NEW HAVEN & HARTFORD.—President Mellen has resigned as president and trustee of the New England Investment & Securities Co., which is the holding company for the Massachusetts trolley properties which the New Haven company was ordered to give up by the Massachusetts legislature.

SOUTHERN PACIFIC.—On April 7 the stockholders voted to increase the common stock by \$100,000,000, of which enough will be set aside to provide for the conversion, at the option of the holder, of the 4 per cent. 20-year convertible bonds, of which \$82,000,000 are to be offered to stockholders about April 20. (Feb. 26, page 436.)

Charles A. Peabody and Robert W. Goelet have been elected directors.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The *Temiskaming & Northern Ontario* is asking prices on two 10-wheel passenger locomotives and four 10-wheel freight locomotives.

General Dimensions.

	Freight.	Passenger.
Weight on drivers	114,000 lbs.	114,000 lbs.
Weight, total	145,000 "	145,500 "
Cylinders	19 in. x 26 in.	19 in. x 24 in.
Diameter of drivers	57 in.	63 in.
Boller, type	Ext. wagn top.	Ext. wagn top.
Boller, wkg. steam press..	200 lbs.	200 lbs.
Heating surface, tubes ...	1,693 sq. ft.	1,693 sq. ft.
" " firebox	139 "	139 "
" " total	1,832 "	1,832 "
Tubes, number	245	245
" outside diameter..	2 in.	2 in.
" length	13 ft. 2 1/4 in.	13 ft. 2 1/4 in.
" material	"Kerva."	"Kerva."
Firebox, length	103 in.	103 in.
Firebox, width	42 "	42 "
Grate area	29.25 sq. ft.	29.25 sq. ft.
Water capacity	5,000 I. gals.	5,000 I. gals.
Coal capacity	10 tons.	10 tons.
Tractive effort	25,800 lbs.	23,400 lbs.

Special Equipment.

Axles	Open-hearth steel.
Bell ringers	Sansom
Boller lagging	Schlater's air cell asbestos
Brakes	Westinghouse, E. T. 6
Brake-beams	Simplex
Brake-shoes	Steel back
Couplers	Tower
Driving boxes	Steel
Headlight	Pyle-National electric
Injectors	Ohio, No. 8
Journal bearings	Canadian Bronze Co.
Piston and valve rod packings	U. S. metallic
Safety valve	Coale
Sanding devices	Wilson
Lubricators	Detroit
Springs	Montreal Spring Works
Staying	Monkbridge staybolt iron
Steam gages	James Morrison, Toronto
Steam heating equipment	Consolidated
Tires	Midvale
Valve gear	Stephens
Wheel centers	Open-hearth steel

CAR BUILDING.

The *Norfolk & Western* is in the market for 300 freight cars.

The *Great Northern* is in the market for 500 refrigerator cars.

The *Long Island* is figuring on 120 steel passenger motor cars.

The *Western Pacific* has ordered 1,500 freight cars from the Pressed Steel Car Co.

The *Iowa Central* has ordered 50 fifty-ton gondola cars from the Pressed Steel Car Co.

The *Boston & Maine* has ordered 1,000 gondola coal cars from the Laconia Car Co.

The *Chicago & Alton* has ordered two postal cars from the American Car & Foundry Co.

The *Oklahoma Midland Electric Railway*, Hobart, Okla., is in the market for two small gasoline motor cars.

The *Lehigh Valley* is said to be in the market for a number of 30-ton dump cars. This item is not confirmed.

The *Chicago & Southern Traction* has ordered the trucks for four new cars from the Baldwin Locomotive Works.

The *Pacific Electric Railway*, Los Angeles, Cal., has ordered 50 fifty-ton steel underframe flat cars from the Pressed Steel Car Co.

The *Chicago & Milwaukee (Electric)*, reported in the *Railroad Age Gazette* of March 26 as being in the market for 12 pay-as-you-enter cars, has ordered 10 cars from the St. Louis Car Co.

The *San Antonio Traction Co.*, reported in the *Railroad Age Gazette* of February 5 as being in the market for 10 semi-

convertible cars, has purchased this equipment from the American Car Co. These cars will be 28 ft. long and will have Brill 27-G. I. trucks.

The *Central Railroad of New Jersey*, as reported in the *Railroad Age Gazette* of April 2, has ordered 15 coaches from Harlan & Hollingsworth. These cars will have a capacity of 75 passengers and will weigh 90,000 lbs. They will be 59 ft. 3 1/2 in. long and 8 ft. 9 1/4 in. wide, inside measurements, and 67 ft. 6 1/2 in. long, 9 ft. 10 1/2 in. wide and 13 ft. 10 in. high over all. The bodies will be of wood and the underframes Commonwealth cast steel. The special equipment will include:

Axles	Central R. R. of N. J. specifications
Bolsters, body and truck	Commonwealth Steel Co.
Brake-shoes	Diamond S
Draft gear	Janney Buhoop
Heating equipment	Steam
Lighting system	Pintsch gas
Platforms	Commonwealth Steel Co.
Springs	Simplex
Trucks	Cast steel
Wheels	Forged steel

The *Erie*, reported in the *Railroad Age Gazette* of March 5 as asking prices on 30 steel underframe express cars, has ordered this equipment from the American Car & Foundry Co. These cars will weigh 60,000 lbs. and will be 60 ft. 1 in. long, 9 ft. 1/4 in. wide and 9 ft. 1 1/2 in. high, inside measurements, and 60 ft. 10 3/4 in. long, 9 ft. 10 1/2 in. wide and 14 ft. 2 3/8 in. high, over all. The bodies will be of wood and the underframes of steel. The special equipment will include:

Axles	Gould
Brakes	Westinghouse
Brake-beams	Damascus
Brake-shoes	Am. Brake-Shoe & Fdry Co.
Couplers	McConway & Torley
Draft gear	Westinghouse
Heating system	Ward Equipment Co.
Journal boxes	Erie standard
Lighting system	Safety Car Heating & Lighting Co.
Springs	Railway Steel Spring Co.
Trucks	American Car & Foundry Co.
Ventilators	Globe, Adams & Westlake Co.
Wheels	Rolled steel, Carnegie Steel Co.

IRON AND STEEL.

The *Interborough Rapid Transit Co.* is in the market for 4,500 tons of rails.

The *Buffalo, Rochester & Pittsburgh* is asking bids on about 3,500 tons of bridge steel.

The *Chicago & North Western* has ordered 4,000 tons of bridge steel from the American Bridge Co.

The *Lake Shore & Michigan Southern* is said to have ordered 3,500 tons of rails from the Illinois Steel Co.

The *Grand Trunk Pacific* has ordered 22,000 tons of 80-lb. rails from the Algoma Steel Co., to be delivered at Ft. William, Ont.

The *Chicago, Burlington & Quincy* has ordered 4,000 tons of structural steel for bridge construction from the American Bridge Co.

The *Panama Railroad* will receive bids until April 15 for 50,000 four-rib, shoulder tie-plates for A. S. C. E. section 70-lb. rail and for 200 kegs 5 1/2-in. by 3/8-in. spikes. Requisition No. 1465.

General Conditions in Steel.—There has probably been less activity in steel during the past week than during any similar period since the open market was announced. Final action on the new tariff schedules seems necessary before there is any placing of contracts, a good number of which are known to be in the inquiry stage. As has been the case for several weeks past, the main activity has been in structural steel, although some rail contracts are reported placed this week.

RAILROAD STRUCTURES.

MEMPHIS, TENN.—According to press reports work is to begin at once on the Union passenger station to be used by all the roads entering Memphis except the Southern. Much

preliminary work has already been done. The total cost of the improvements will be about \$6,500,000. (Oct. 30, p. 1267.)

NEW YORK, N. Y.—In the fire which destroyed the repair shops of the Interborough Rapid Transit Co., at Second avenue and 129th street, there were 11 steel and 6 composite cars burned. The loss was about \$173,000, about \$135,000 of which is charged to shop tools and cars.

TACOMA, WASH.—The Chicago, Milwaukee & Puget Sound has given the contract for the erection of three grain and general freight warehouses and the export lumber dock to the Burill Bridge & Dredging Co., and work is to begin at once. Contracts for the foundations of the warehouses were previously given to John Huntington, of Tacoma.

OKLAHOMA CITY, OKLA.—The Oklahoma City Street Railway has prepared plans for a new eight-track car barn, 100 ft. x 160 ft.; an inspecting, washing and light repairing shed with four tracks, 50 ft. x 200 ft.; a machine shop with two tracks, 50 ft. x 125 ft.; a storeroom with one inside and two outside tracks, 85 ft. x 125 ft.; a woodworking shop with two inside tracks, 50 ft. x 100 ft.; a paint shop with two inside tracks, 45 ft. x 100 ft., and a two-story office building. The buildings will be of pressed brick with concrete roofs and each one story high, except the office building. Buildings and track will cover about 14 acres of land.

SIGNALING.

New Automatic Signals on the Rock Island.

The Chicago, Rock Island & Pacific has completed the installation of automatic block signals, giving indications in the upper quadrant, on the Iowa division, between Missouri Division Junction, near Davenport, Iowa, and Iowa City, double track, 71 signals in all, and all of them three-position. The signals are style "B" and style "S," made by the Union Switch & Signal Company. The installation includes one gauntlet over a bridge at Moscow, three sets of crossing bells and two interlocking plants, one at Missouri Division Junction and one at Iowa City. The gauntlet is protected by automatic block signals normally indicating stop. They are cleared only on the approach of a train. All other signals, except the home and distant signals at interlocking plants, are normal clear.

The plant at Iowa City protects the end of double-track and the apparatus is the General Railway Signal Co.'s all-electric. At Missouri Division Junction there is a mechanical machine, but the signals are of the automatic type. There are two single-arm home signals, both style "B" Union, and one two-arm home signal, both arms giving three indications in the upper quadrant. This is a model 5 type made by the General Railway Signal Company. Both plants have been in service some time but were modified to meet the requirements of automatic block signaling. The Iowa City plant has approach, detector and indication locking.

All signals are controlled by line circuits. "Cut sections" in the tracks are relayed except in special cases, as where crossing bells occur. The "distant" control circuit is taken through switch boxes on all facing point switches. In some cases the polarized line circuit is used, as where otherwise it would be necessary to use two line relays. Indicators are provided at all switches, there being 67 in all. The length of block varies to suit local conditions, from 2,000 ft. at the Moscow gauntlet to 20,460 ft. All wires from pole lines to apparatus are carried in cable to iron cable posts on which are mounted relay boxes or switch indicators, as the case may be. Thus underground wires are reduced to a minimum.

BSCO and Schoenmehl primary batteries are used for the control and operation of all automatic block signals. There are 16 cells to each signal, placed in Massey concrete wells. The gravity battery for track circuits is placed in the same well when possible.

All line relays are 500 ohms resistance, all track relays 4 ohms resistance. There are in use "Universal" and "R. S. A." relays made by the Union Switch & Signal Co.; model 9 relays made by the General Railway Signal Co., and type "E. B." made by the Hall Signal Co. All work was done by the railway company's signal forces.

Supply Trade News.

Among the recent orders received by Tate, Jones & Co., Inc., Pittsburgh, Pa., is an extensive one from the Erie Forge Co., Erie, Pa., for fuel oil burning equipment for use in open hearth furnaces.

The Helwig Manufacturing Co., St. Paul, Minn., manufacturer of pneumatic tools and other labor saving devices, has established a European office in Paris at 19 Rue De Lambre, in charge of A. L. Helwig.

E. D. Clapp, who was formerly the Chicago representative of the Jeffrey Manufacturing Co., Columbus, Ohio, and the Ohio Malleable Iron Co., Columbus, has associated himself with the W. K. Kenly Co., Chicago.

Morris B. Brewster has been appointed representative, at the Chicago office, 509 Great Northern building, of the American Locomotive Sander Co., Philadelphia, Pa., and the United States Metallic Packing Co., Philadelphia.

The Empire Car Co., Chicago, has been incorporated with \$15,000 capital to build and repair railway cars and to manufacture and sell other merchandise. The incorporators are: J. B. Koon, P. J. Minogue and M. F. Sullivan.

The Whiting Foundry Equipment Co., Harvey, Ill., announces the appointment of L. G. Henes, with office in the Monadnock building, San Francisco, Cal., as its representative for cranes and foundry equipment for the states of California, Nevada and Arizona.

The Damascus Brake Beam Co., Cleveland, Ohio, in order to carry a larger stock of finished product as well as to make room for additional machinery for the economical manufacture of its trussed beams, is extending its Sharon plant. The management also has under consideration the purchase of a site for a branch factory between Chicago and Gary.

The Isthmian Canal Commission, Washington, D. C., asks bids until May 6 on semi-marine boilers, air compressor, fire-alarm system, electric motor, electric-driven wood-working machines, machine shop machines, tin and copper smith tools, drill chucks, vises, sheaves, shafting, rock drill steels, cypress water tank hose, lumber, etc. (Circular No. 503.)

H. F. Wardwell, formerly Chief Clerk to F. A. Delano, President of the Wabash, has become associated with the Hicks Locomotive & Car Works, Chicago, with office at Chicago. Mr. Wardwell served three years as a special apprentice in the mechanical department of the Chicago, Burlington & Quincy, and was subsequently Chief Clerk to Mr. Delano for four years.

The Consolidated Railway Electric Lighting & Equipment Co., New York, announces that this company stands alone and has no connection of any kind with any other electric car lighting company, notwithstanding rumors that have been persistently circulated to the contrary. It has perfected special machinery for the manufacture of its equipments for electric car lighting, and is prepared to offer better terms and lower prices than heretofore have been possible.

Among recent orders received by the O. M. Edwards Co., Syracuse, N. Y., for car window fixtures are the following: Window design, 7½-D1, for 30 passenger coaches, Chicago, Rock Island & Pacific. These cars are being built by the American Car & Foundry Co.; window design, 13-O-B-F-1, for 15 coaches, Central of New Jersey, being built by Harlan & Hollingsworth; window design, 13-O-D-1, for 63 cars, United Railways of St. Louis, being built at the railway company's shops.

The Buckeye Steel Castings Co., Columbus, Ohio, has opened an office in Chicago in charge of C. B. Goodspeed as Western representative. It occupies the rooms on the sixth floor of the Railway Exchange building, which were used by Julian L. Yale & Co., Chicago, who have been its Chicago representatives for several years. Fred J. Cooleedge, who was formerly connected with Julian L. Yale & Co., has become associated with the Buckeye company, and will retain his headquarters at Chicago.

The Consolidated Supply Co., Chicago, announces that it will remove its offices on May 1 from 321 Dearborn street to 138 Jackson boulevard, in the Western Union building. It has just been appointed the selling agent, to all the railways having headquarters in Chicago, for the Alamo gas and gasoline engines, manufactured by the Alamo Manufacturing Co., Hillsdale, Mich. This engine was shown at the Coliseum during the recent Maintenance of Way convention at Chicago. The Alamo company makes a full line of standard engines for pumping and coaling stations, hoisting outfits, electric light plants, etc.

The Duntley Manufacturing Co., Chicago, which was organized about two months ago under the laws of Delaware, has announced its permanent organization. The officers are: President, J. W. Duntley, formerly President of the Chicago Pneumatic Tool Co., Chicago; Vice-President, A. W. Maconochie; Secretary, F. A. Rautenberg; Treasurer, Eugene McComas. The directors are J. W. Duntley, H. W. Davis, M. H. Tichenor, Samuel Deutsch and W. J. Calhoun. The company manufactures the Rockford gasoline motor cars for section men, signal, telegraph and bridge inspectors; also vacuum cleaners and calculating machines. The offices of the company are on the fourth floor of the Plymouth building.

TRADE PUBLICATIONS.

Triple Valve.—The Westinghouse Air Brake Co., Pittsburgh, Pa., has just issued instruction pamphlet No. 5,030, which supersedes the issue of May, 1907. This pamphlet covers the type K triple valve.

Coal Dealers' Supplies.—The C. W. Hunt Co., New York, has just issued a small pamphlet describing the line of coal dealers' supplies which it manufactures, including mast and gaff fittings, automatic railways, coal tubs, hoisting blocks, screens, valves and "Stevedore" hoisting rope.

Paints.—The Detroit Graphite Co., Detroit, Mich., has just issued a very attractive booklet entitled "The Home of Good Paint," giving a history of its plant from the beginning to the present time and telling how it is equipped to manufacture paint for various purposes. A copy of the publication will be sent to anyone interested.

Roofing.—The Barrett Manufacturing Co., New York, is mailing a leaflet which tells of the service of the coal tar pitch, tarred felt and gravel roofing on two large textile mills in Lowell, Mass. This roofing covers 1,500,000 sq. ft. in one case and 300,000 sq. ft. in the other, and was laid along the lines of the Barrett specification.

Gould Battery.—The Gould Storage Battery Co., Depew, N. Y., has just issued a catalogue on the Gould battery in isolated lighting plants. The information is divided into several chapters, one on the selection of the proper battery, another on the method of operation, another on details of installation, etc. A number of line drawings are included.

Bush Train Shed.—Lincoln Bush, Consulting Engineer, 1 Madison avenue, New York, and formerly Chief Engineer of the Delaware, Lackawanna & Western, has published in pamphlet form a reprint of an article in the *Railroad Age Gazette* of March 19, 1909, describing the Bush train shed at Scranton, Pa. Copies will be sent to those desiring them.

Who Makes What.—Daniel T. Mallett, publisher, New York, has just issued under this title a book of reference for buyers. It is a directory of manufacturers, products, foreign merchants, wholesale hardware merchants, jobbers and export houses. The book contains some 327 pages and the information is divided into five separate parts under the above headings.

Chicago, Burlington & Quincy.—Camp and ranch life in the Yellowstone country is attractively portrayed in a folder just issued. The country and its possibilities for big game hunting and sports, near Cody, Wyo., and the Cody road into the Yellowstone Park, are particularly interesting features. It is well illustrated with out-of-door scenes and contains a map of the district described.

Tie Plates and Angle Bars.—The Sellers anchor bottom tie plate is described in a catalogue recently issued by the Sellers Manufacturing Co., Chicago. The distinctive feature of this tie plate is that corrugations on the bottom engage the tie instead of flanges or claws. This tie plate is in use on 73 railways and many advantages are claimed for its use. The Sellers flat bottom tie plate and angle bars are briefly described in the publication.

Northern Pacific.—The Alaska-Yukon Pacific Exposition, which will be held in Seattle, Wash., from June 1 to October 16, this year, is well illustrated and described in a 50-page booklet issued by the Northern Pacific. The many side trips of interest that may be taken while at the exposition and the accommodations furnished on these tours are also described in the publication. A copy of the booklet may be secured by applying to A. M. Cleland, General Passenger Agent, at St. Paul, Minn.

Chinese Railways.

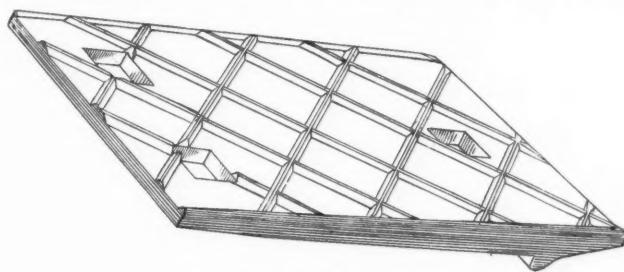
A consular report quotes a Chinese paper as follows: The ministry of communications has issued instructions to Taotai Chan, commanding him to make a careful survey from Kalgan to Kuei-huacheng and Shui-yuancheng, on the Shansi and Mongolian borders, so that the Peking-Kalgan Railway may be extended to the two cities and thence to Kulun (Urga, capital of Mongolia) and Kiakhta, on the Russo-Chinese frontier. It will further be extended to Kansuh and Hsinchiang, forming the great northwestern link as approved by the Chinese Government. It is estimated that from \$10,000,000 to \$15,000,000 will be required for extending the Peking-Kalgan line to Kiakhta via Kuei-huacheng and Kulun, and it will take more than six years to build it. As Taotai Chan, who was educated in the United States, and is probably one of very few competent Chinese railway engineers who can build lines without foreign assistance, has shown skill and experience in building the Peking-Kalgan Railway, the ministry of communications will no doubt put the full responsibility of the extension on his shoulders.

Sellers Anchor-Bottom Tie Plate.

The Sellers anchor-bottom tie plate, with oblique corrugations, was described in the *Railway Age* two years ago (April 12, 1907, page 621). At that time the corrugations covered only about five-eighths of the length, there being a plain portion at each end. The design has since been improved by the extension of the corrugations to cover the entire bottom, as shown in the illustration herewith.

The advantages claimed for this design of tie plate are:

That the corrugations compress and engage the top fibers of the tie but do not cut the same, making no openings for the entrance of water



Under Side of Sellers Tie Plate.

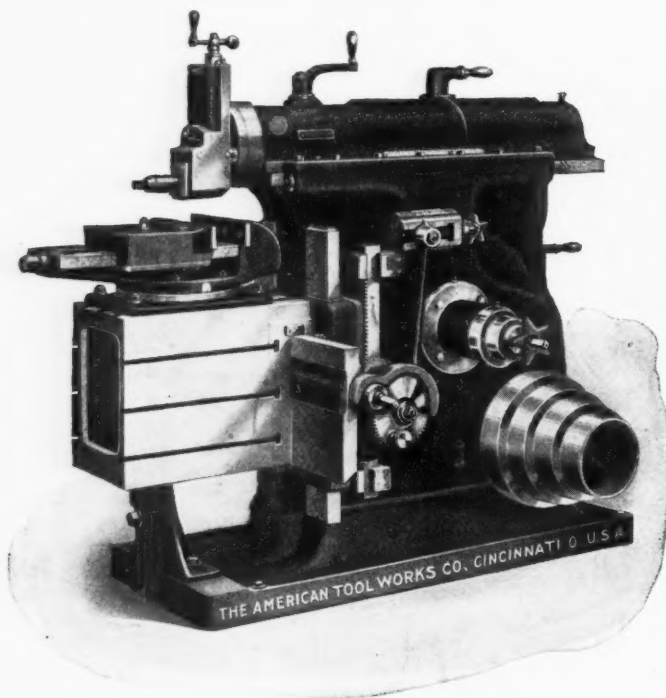
and other foreign substances which cause decay; the angular arrangement of the corrugations provides a maximum surface to resist lateral, or track-spreading, stresses; the corrugations grip the wood firmly without tearing it; the plate protects the spike, preventing necking, and maintains its position when once applied. The makers report having in their possession ties used with these plates for eight years, showing no wear of the plate into the tie, the wood showing only the imprint of the corrugations, which compressed the fibers to a depth of about $\frac{1}{4}$ in.; neither is there indication of any movement of the plate. These plates are made of rolled wrought iron to minimize abrasion between plate and rail, corrosion from brine drippings, and crystallization from repeated stresses. They are made in different sizes and thicknesses and are punched with two, three or four holes for different weights of rail. They can also be given combination punchings for use with two different sizes of rails.

They are made by the Sellers Manufacturing Co., Chicago, and are

in use on 73 roads. The company also makes a flat bottom plate for electric and elevated roads, punched for either ordinary or screw spikes.

American 21-in. Back-Geared Crank Shaper.

The shaper shown herewith is designed to be heavy and powerful, with extension base and 15-in. to 30-in. stroke. It is intended for high-speed work production, accuracy of alignment and durability. The column is deep and wide, tapering slightly toward the top. It is thoroughly braced internally, and is further reinforced outside on the line of strain by a wide deep rib cast integral with the wall. The column



American 21-in. Back-Geared Crank Shaper.

projects both front and rear at the top, providing a long bearing for the ram. The base, of extension type and pan design, is of large proportions, deep and strongly ribbed. A pad is placed at the end to receive the table support.

The ram is heavy and designed for uniform rigidity throughout the entire length of stroke. It is thoroughly braced by internal ribs and has long wide bearings on the column with continuous taper gib, having end screw adjustment. The stroke of the ram is positive with 8 speeds, ranging from 7.7 to 96 strokes per minute. The length of stroke may be easily changed without stopping the machine, and the device for ranging the stroke is located on the ram near the head, and may also be operated while the machine is running. The rocker arm is heavy and thoroughly braced and gives the ram a practically uniform rate of speed throughout its entire stroke and also provides quick return. The machine is readily changed from single to back-geared through a convenient self-locking lever, and has a back-gear ratio of 24.3 to 1, which with the large cone pulley gives ample power for taking heavy cuts. The length of stroke is 21.5 in.

The head is operative at any angle within an arc of 100 deg. The down slide is fitted with continuous taper gib, having end screw adjustment. The down feed is long, the screw having an adjustable graduated collar reading to 0.001-in. The tool post is large for using holders with inserted cutters, and has a tool-steel tool post screw and serrated back plate. The down feed is 9 in. The table, of box form with three T-slots on both top and sides cut from the solid, is easily detachable, and is thoroughly braced internally to insure accuracy and stiffness. The vertical travel is 14.5 in. and the horizontal travel is 26.5 in.

The apron is accurately fitted to the cross rail and provided with continuous taper gib, with end screw adjustment. There are three T-slots on the face of the apron for clamping work when the table is removed. The cross rail, which is bolted to the column to prevent it from dropping away when the binder bolts are loosened, is of box form, heavily ribbed. It is of good length to give the table a long horizontal range of travel. The bearings, scraped to surface plates, are extra wide. A telescopic elevating screw of large diameter, with ball-bearing thrust, facilitates elevating the rail. This screw enables the machine to be set on a concrete or other floor without requiring a hole through the floor to accommodate its travel. The elevating gears are of steel, cut from the solid.

The cross feed is of new design, variable and automatic, with a range of 0.008-in. to 2 in., obtainable while the machine is running. The slot head is located near the top of the column, conveniently operated and set by the star knob. It is supplied with graduations either side of zero, reading from 1 to 25 notches each of which represents 0.0008-in. feed. It is unnecessary to adjust the feed mechanism due to any change of position of the rail.

The rocker arm is made in double section at the top, and this, with the large opening through the column, permits a shaft 3.5 in. in diameter to be passed under the ram for keyseating. Larger shafts may be keyseated by setting over the table to allow the shaft to pass outside of the column, using the head set at an angle. The vise, of heavy pattern, is of new design with deep steel-faced jaws. It is clamped with four bolts to the swivel base, which is large, covering nearly the entire area of the table. The vise screw has a bearing at both ends and is always in tension when holding work.

The countershaft has tight and loose pulleys 16 in. in diameter by 4.25-in. face, to run 190 r. p. m. All gears, of coarse pitch and wide face, are cut from the solid with special cutters. The pinions in the driving train are cut from bar steel. All bearings are wide and scraped to surface plates. All running bearings are bushed, and the one for driving pulleys, large and cast integral with the column, is long and extends well into the center of the cone, which eliminates the necessity of an outboard bearing for the cone shaft. This bearing is bronze bushed. All shafts are of high carbon crucible steel accurately ground.

These tools are made by the American Tool Works Co., Cincinnati, Ohio, in 15-in. single-geared and 16-in., 18-in., 21-in., 25-in., and 30-in. back geared.

Granite Roofing With Six-Inch Solid Lap.

The Eastern Granite Roofing Co., New York, has improved its roofing by making a wider marginal lap than has formerly been customary with roofings of this class. This new lap is called "Safeguard," and is claimed by the makers to be a great improvement over any other wide marginal lap used on stone surfaced roofing. The "Safeguard" lap is a continuation of the sheet, extending 6 in. from the graveled surface, giving the lap a solid and strong foundation for nailing and a greater resistance against wind storms.

The older style laps consist of 4 in. of light single-ply felt extending beyond the narrow 2-in. margin of the sheet, thus giving only a 2-in. margin for nailing; the "Safeguard" lap gives 6 in. of margin,



Granite Roofing With Wide Lap.

permitting double nailing when necessary in places where the roofing is exposed to heavy wind storms.

When laying Granite Roofing with this wider lap, it is not necessary to nail through the surface, all the nailing being done on the under sheet, as the cement is sufficient to hold down the overlapping sheet. All nails are thus entirely concealed, adding to the neatness and finish of the roofing, which presents the appearance of a continuous unbroken sheet. As there is no nailing through the upper or exposed surface, leaks from nail holes become impossible.

The sheets will lie with 26 in. of their surface exposed to the weather instead of the usual 29-in. width, adding considerably to the resistance of the roofing in wind storms.

ANNUAL REPORT

SEVENTY-NINTH ANNUAL REPORT OF THE DELAWARE AND HUDSON COMPANY:—YEAR ENDED
DECEMBER 31, 1908.

The results from operation of the Coal and Coal Sales Departments of the Company were:

	Coal produced purchased	On hand and December 31st	†Receipts	††Expenses	Net.
1908....	6,814,200	353,782	\$23,847,116.58	\$22,993,999.99	\$853,116.59
1907....	7,005,987	374,984	23,184,765.92	22,227,283.79	957,482.13
Increase.	*191,787	*21,202	\$662,350.66	\$766,716.20*	\$104,365.54

*Decrease.

†Includes cost of coal added to stock during year.

††Including taxes.

The results from operations of the Railroads of the Company were:

	Miles	Earnings	*Expenses	Net earnings	Pctg of expenses to earnings
1908....	845.26	\$18,500,731.43	\$10,811,720.87	\$7,689,010.56	58.44
1907....	844.76	20,165,440.26	11,694,428.92	8,471,011.34	57.99
Decrease	†.50	\$1,664,708.83	\$882,708.05	\$782,000.78	†0.45

*Excluding taxes.

†Increase.

The general distribution of the earnings and of the operating expenses of the railroads of the Company was as follows:

	1908.	1907.	Increase or decrease
EARNINGS.			
From coal freight traffic..	\$9,106,819.84	\$9,081,664.11	\$25,155.73
From merchandise freight traffic	6,162,180.98	7,553,810.11	\$1,391,629.13
From passenger traffic....	2,693,672.13	2,944,742.98	251,070.85
From express traffic.....	189,656.38	198,800.11	9,143.73
From transportation of mails	132,315.96	132,021.87	294.09
From miscellaneous sources	216,086.14	254,401.08	38,314.94
Gross earnings	\$18,500,731.43	\$20,165,440.26	\$1,664,708.83
EXPENSES.			
For maintenance of way and structures	\$1,417,318.58	\$1,879,545.69	\$462,227.11
For maintenance of equip- ment	2,219,542.60	2,356,513.74	136,971.14
For traffic expenses.....	204,849.29	191,668.69	13,180.60
For conducting transporta- tion	6,528,112.31	6,900,430.56	372,318.25
For general expenses.....	441,898.09	366,270.24	75,627.85
Total expenses.....	\$10,811,720.87	\$11,694,428.92	\$882,708.05
Net earnings from opera- tion	\$7,689,010.56	\$8,471,011.34	\$782,000.78
Percentage of expenses to earnings.....	58.44	57.99	0.45

NOTE—Decreases in *italics*.

GENERAL INCOME ACCOUNT OF THE DELAWARE AND HUD-
SON COMPANY, YEAR ENDED DECEMBER 31, 1908.

	1908.	1907.	Increase or decrease
COAL DEPARTMENT.			
Gross receipts	\$23,847,116.58	\$23,594,415.37	\$252,701.21
Gross expenses (excluding taxes of \$292,301.73)...	22,701,698.26	22,421,209.79	280,488.47
Net earnings	\$1,145,418.32	\$1,173,205.58	\$27,787.26
RAILROAD DEPARTMENT.			
Gross earnings.....	\$18,500,731.43	\$20,165,440.26	\$1,664,708.83
Operating expenses (ex- cluding taxes of \$413,- 029.20)	10,811,720.87	11,694,428.92	882,708.05
Net earnings from op- eration	\$7,689,010.56	\$8,471,011.34	\$782,000.78
OTHER INCOME.			
Hire of equipment	\$275,046.59	\$91,600.41	\$183,446.18
Outside operations	Dr. 1,417.17	3,704.83	5,122.00
Dividends and interest on securities owned.....	803,599.38	1,117,672.44	314,073.06
General interest and dis- count	375,163.23	178,889.81	196,273.42
Miscellaneous items	52,283.39	172,433.48	120,150.09
Total other income....	\$1,504,675.42	\$1,564,300.97	59,625.55
Gross income	\$10,339,104.30	\$11,208,517.89	\$869,413.59
DEDUCTIONS FROM INCOME.			
Rentals	\$1,897,628.11	\$2,353,527.58	\$455,899.47
Taxes	705,330.93	568,589.47	136,741.46
Interest on 1st and refund- ing mortgage bonds (1913)	243,998.34	.....	243,998.34
Interest on 1st mortgage bonds (1917)	350,000.00	350,000.00	.....
Interest on D. & H. debenture bonds (1916)	559,080.00	559,540.00	460.00
Interest on 1st lien equip- ment bonds (1922).....	450,000.00	258,750.00	191,250.00
Interest on car trust bonds (1909)	7,875.00	13,125.00	5,250.00

	1908.	1907.	Increase or decrease.
Interest on equipment deb- enture bonds (1914)...	44,000.00	52,000.00	8,000.00
Interest on divisional bonds	75,000.00	75,000.00	.....
General interest and dis- count	707,299.73	485,352.05	221,947.68
Miscellaneous items	44,433.83	26,460.38	17,973.45
Total deductions.....	5,084,645.94	4,742,344.48	342,301.46
Net income carried to gen- eral profit and loss.....	\$5,254,458.36	\$6,466,173.41	1,211,715.05
	12.39% on	15.25% on	
	\$42,400,000.00	\$42,400,000.00	

FINANCIAL.

The Consolidated Balance Sheet shows an increase of Capital Liabilities of \$10,488,540.77, the principal changes being as follows:

FUNDED DEBT.

On May 12, 1908, the stockholders authorized the execution of a first and refunding mortgage to an issue of \$50,000,000 of the Company's First and Refunding Mortgage Gold Bonds, bearing interest not to exceed 4 per centum, payable semi-annually, free of all taxes, and for not less than thirty-five years.

- \$6,500,000 of said bonds to be reserved to redeem and extinguish mortgage liens then existing to that amount on portions of the Company's property.
- \$20,000,000 of said bonds to be issued at once for the purpose of discharging the Company's outstanding obligations maturing during the year 1908, and for construction work then in progress, or its general corporate purposes.
- \$23,500,000 of the said bonds to be issued from time to time thereafter for the corporate purposes of the Company, but not before May 1, 1909.

The execution and form of this mortgage were duly approved by the Public Service Commission of the Second District of the State of New York by orders made on July 9 and July 29, 1908.

Upon application duly made to the Commission for its consent to the issue of \$20,000,000 of the said bonds, for the purpose of discharging certain of the Company's outstanding obligations incurred before the passage of the Public Service Commissions Law, the Commission has authorized the issue of \$13,539,000 of the said bonds, of which bonds aggregating \$13,309,000 were issued and sold during the year.

The Commission originally reserved for further hearing the question of giving its consent to the issue of the remaining \$6,461,000 of the said \$20,000,000 of bonds. The Company had applied for the issue of these remaining bonds for the purpose of discharging its obligations incurred to pay the cost of the purchase by the Company in 1906 and 1907 of the outstanding securities of the Hudson Valley Railway Company and on account of the purchase by the Company, made in 1906, of additional coal lands in the State of Pennsylvania. Further hearings were duly had before the Commission upon the questions so reserved and were completed on September 8th last. The Commission, however, did not announce its decision as to the issue of these bonds until December 17th last, when it handed down an order dated December 7, 1908, refusing to consent to such issue. In this decision three of the Commissioners concurred; one Commissioner dissenting wholly from the decision, and another in part. The Company has taken proceedings to have this decision reviewed by the Supreme Court upon *certiorari*.

In accordance with the provisions of the Equipment Trust Indenture, dated June 1, 1907, \$650,000 was paid to the Trustees on July 1, 1908, and of this amount \$637,147.45 was expended in the purchase of thirty new consolidation locomotives.

The amount of Car Trust Certificates of 1909 shows a reduction of \$150,000, the bonds maturing May 15, 1908, having been retired under Sinking Fund provisions of the mortgage.

The amount of Debentures of 1914 shows a reduction of \$200,000, the bonds maturing January 1, 1908, having been retired under the provisions of their issue.

The Hudson Coal Co. Debenture Bonds of 1917 and 1918 show reductions of \$100,000 and \$125,000 respectively, or \$225,000 in all, these amounts having been retired during the year under the provisions of their issue.

FLOATING DEBT.

The Floating Debt of The Delaware and Hudson Company on December 31, 1907, amounted to \$10,754,949.87. This was increased during the year to \$21,143,550 by the payment of the \$6,000,000 Collateral Trust Notes of the Quebec, Montreal and Southern Railway Company, due February 6, 1908; by final payments on account of the purchase of coal lands in Schuylkill County, Pennsylvania, and by expenditures for railroad construction.

In July, 1908, the Delaware and Hudson Company sold \$13,309,000

of First and Refunding Mortgage Gold Bonds at 95 and accrued interest, thus realizing on account of the principal of said bonds \$12,643,550, which was used to reduce the outstanding temporary loans, leaving a balance outstanding on December 31, 1908, of \$8,500,000. The discount on these bonds has been charged to General Profit and Loss.

MERGERS.

On May 23, 1908, the New York and Canada Railroad Company was merged with The Delaware and Hudson Company under Sections 53, 54, P. S. C., State of New York, and certificate of merger filed in the office of the Secretary of State on that date.

On July 17, 1908, the Cherry Valley, Sharon and Albany Railroad Company was merged with The Delaware and Hudson Company under Sections 53, 54, P. S. C., State of New York, and certificate of merger filed in the office of the Secretary of State on that date.

By virtue of said mergers there has been added to the physical property of your Company 170.71 miles of road, valued at \$9,589,100, and the Stocks and Bonds decreased accordingly.

DIVIDENDS.

On December 30, 1908, a dividend for the year 1909, upon the outstanding \$42,400,000 of Capital Stock of this Company, was declared out of the earnings for the preceding years at the rate of nine (9) per cent. upon the par value thereof, and amounting in the aggregate to \$3,816,000, payable as follows:

Two and one-quarter (2¼) per cent. upon the Capital Stock in favor only of the stockholders of record upon February 27, 1909, and payable upon March 20, 1909.

Two and one-quarter (2¼) per cent. upon the Capital Stock in favor only of the stockholders of record upon May 29, 1909, and payable upon June 21, 1909.

Two and one-quarter (2¼) per cent. upon the Capital Stock in favor only of the stockholders of record upon August 30, 1909, and payable upon September 20, 1909.

Two and one-quarter (2¼) per cent. upon the Capital Stock in favor only of the stockholders of record upon November 29, 1909, and payable upon December 20, 1909.

GENERAL REMARKS.

IMPORTANT ADDITIONS AND BETTERMENTS.

In the annual report for the year 1907 there were reported as approaching completion the third and fourth tracks between Green Ridge and Carbondale, the second track between Schenectady and Delanson, and the second track between Watervliet and Waterford Junction, all of which work was completed and the tracks put in operation early in the year 1908.

On account of the installation of a heavier type of locomotive it became necessary to strengthen various bridges on the Susquehanna and Pennsylvania divisions—\$186,843 has been appropriated for this work, of which sum \$89,977.72 was expended during the year.

The extension of the Quebec, Montreal and Southern Railway from Pierreville to Ste. Philomene has been completed, with the exception of the bridge at Nicolet. It is expected that the new main line will be placed in operation about May 1, 1909.

The Salem Branch of the Greenwich and Johnsonville Railway Company, connecting the Rutland and Washington Branch of The Delaware and Hudson Company with the main line of the Greenwich and Johnsonville, has been completed and put into operation.

This branch consists of 10.20 miles of track, built at a cost of \$387,865.13, the funds necessary to construct same being temporarily advanced by your Company.

During the year the Mechanicville Steam Power Plant was completed and began operations. The severe drought that prevailed during the Summer and Fall greatly retarded the production of electric power by means of water courses, and at the same time fully demonstrated the wisdom of construction of this plant. This drought affected the operations of the water power companies, making necessary the operation of the new Mechanicville steam plant for the maintenance of the service on your electric railways, the surplus power being sold to the water power companies.

A new high power line connecting this power plant with the substations at Lansingburg, Twenty-fifth Street, Watervliet and North Albany, will be built during the year 1909 by the United Traction Company.

COAL DEPARTMENT RELIEF FUND.

The report of the Coal Department Relief Fund for the year ending December 31, 1908, is as follows:

RECEIPTS:		
Balance on hand, January 1, 1908.....		\$9,966.97
Contributed by employees in 1908.....	\$1,718.39	
Contributed by The Delaware and Hudson Company, 1908	8,725.00	
		10,443.39
Total		\$20,410.36
DISBURSEMENTS:		
Accident death benefits.....	\$2,568.66	
Accident disablement benefits.....	15,059.33	
		17,627.99
Balance on hand December 31, 1908..		\$2,782.37

These funds were authorized by vote of the stockholders on May 10, 1887, since which time the benefits paid have amounted to \$299,636.44, to which the Company contributed \$150,952.36.

COAL DEPARTMENT OPERATIONS.

The colliers and washeries of the company were operated to their full capacity throughout the year, producing 6,526,871 tons of anthracite coal out of a total of 64,665,914 produced in the region. At the close of the year there were in the several storage plants 353,782 tons.

The Coal Department expenses include construction and betterments amounting to \$650,282.95.

Taxes of the Coal Department for the year 1908 show an increase of \$76,578.28.

RAILROAD DEPARTMENT OPERATIONS.

Owing to general depression in business which existed throughout the country the earnings from Passenger Service and from Merchandise show a material reduction.

The earnings from Coal Freight Traffic show a slight increase, due to the placing by the Company of an increased tonnage of its coal in markets securing to its railroad lines a longer haul.

The ratio of Expenses to Earnings for 1908 shows an increase of ⁴⁵/₁₀₀ of 1% over 1907. The increases paid in wages of employees in Shop, Track, Engine, Train and Yard Service, in effect in 1908, were only in effect during portions of the year 1907.

Taxes of the Railroad for the year 1908 show an increase of \$60,163.18.

ELECTRIC RAILWAY EARNINGS.

The earnings of the electric lines fell off during the general depression of business. They were particularly affected by reason of the partial closing down for several months of the plants of the International Paper Company, General Electric Company, and the American Locomotive Company.

There was a decrease in net earnings of the United Traction Company of \$29,701.30; of the Hudson Valley Railway of \$74,366.80; of the Troy and New England Railway of \$905.30, and of the Schenectady Railway (including Electric Express Co.) of \$55,196.57. The net earnings of the Plattsburgh Traction Company increased \$1,478.99.

A dividend of 4 per cent. was declared on the capital stock of the United Traction Company for the year 1908. No dividends were declared by the other companies.

LITIGATION.

Early last year an amicable arrangement was made between the United States Attorney General and the Anthracite Coal Carrier Corporations to test the constitutionality of the so-called Commodity Clause of the Hepburn Act, amending the Interstate Commerce Act passed July 29, 1906, which statute attempted to forbid railroad corporations from transporting in interstate commerce any commodity mined, produced or owned by such carrier corporation, or in which it had any interest direct or indirect. In September last the statute in question was declared invalid by the United States Circuit Court for the Eastern District of Pennsylvania. From this decision an appeal was taken by the Attorney General to the United States Supreme Court, which appeal has been argued and is still under advisement by the Court.

In May and June, 1908, several parties claiming to be owners of Debenture Bonds of the Company brought vexatious suits against the Company, seeking to enjoin the payment of its June dividend. The same parties also attempted to present the matter of the payment of this dividend to the Grand Jury of this City under claims that such dividend was not declared out of profits. The Company promptly met all these attacks, and in each instance defeated the same.

The Annual Report of the Company for 1907 stated that certain stockholders of the Albany and Susquehanna Railroad Company had obtained a judgment against this Company for \$1,070,923.24, from which the Company had taken an appeal. Upon the argument of this appeal before the United States Circuit Court of Appeals that Court announced that there was a preliminary question affecting to some extent the jurisdiction of the Court, and that it had therefore certified that question to the United States Supreme Court. It is expected that the decision of the United States Supreme court upon this question will be made at an early date.

For many years disputed questions had been in litigation under leases made by this Company of what is known as the Genget Coal Properties near Scranton. All these questions have been set at rest by the acquisition of the fee of such property upon terms which the Company considered to its advantage.

Questions are in litigation in respect to the contract under which the Company is operating the Ticonderoga Railroad, about 1.41 miles in length. The matter is pending before a Referee.

By order of the Board of Managers,

L. F. LOREE,
President.

Construction and betterment included in operating expenses of coal department in 1908 amounted to \$650,282.95, the largest single item being for sinking shafts and shaft improvements, which amounted to \$150,826.35.

Expenditures on account of railroad department construction in 1908 amounted to \$1,179,494.19, the largest single item being for additional main and side tracks, which amounted to \$715,832.22.